AIR CONDITIONING HEATING & REFRIGERATION NEWS
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Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Stories of the Week
True Story
Consumer Orientation
Interim Smile
Quotes of the Week

Stories of the Week

Faker who'd been brushed by a Greyhound bus won a lawsuit for big damages. Attorney for the bus company warned him privately:

"You'll never get away with this. We're going to tail you night and day. Sometime you'll get tired of that wheelchair; and when you do, we'll have a movie record of it."

"So I'll help you," agreeabled Sam. "Here's my itinerary: Today I go home. Tomorrow I sail on the *Queen Mary* for London. There I'll stay at the Dorchester for three days. Then I take the channel boat to France. From Cherbourg the train to Lourdes.

"At Lourdes, my friend, you'll see a mighty quick miracle!"

Shocked was Rev. Jones when he discovered his wife fingering in the coins gathered during a Sunday church collection.

"Martha, what are you doing?" he exclaimed.

"What do you think I'm doing?" she annoyed. "I'm looking for a button to sew on your coat."

True Story

Red-faced should be Vladimir Morozov of the Russian Embassy staff in Washington. In a question-and-answer period following a speech at Penn State university, a Turkish exchange student thrust:

"Why do so many of your people leave your country when they get a chance?"

"They don't," said Morozov, flatly.

"But they do," countered the student. "I'm from Turkey, and my family has fed and housed hundreds of them."

"Oh," flustered the flunkie, "maybe a few do *escape* now and then."

Consumer Orientation

American corporations are making increased use of formally organized marketing departments, a research study issued by the American Management Association indicates.

The survey covered 195 companies in various parts of the United States, all of which carry on some sort of marketing re-

(Concluded on Page 8, Col. 1)

Research Group Tells Contractors

You Can Net 8-15% by Curbing Costs

* * *

RALEIGH, N. C.—By keeping close watch and control over his operating expenses, the average contractor doing about $200,000 in sales a year should net 12 to 15% profit (for individuals or partnerships) or 8 to 10% for corporations, believes the Heating and Air Conditioning Research and Development Association here.

A budget suggested by the association for 1959 has the total cost of sales amounting to 73%.

Total operating expenses in this budget amount to 12.7% of sales for individually owned businesses and partnerships or 18.7% of sales for corporations (allowing 6% for officers' salaries).

"These percentages are being made by some of those dealers who take monthly services and really study and control their business," the association has said.

Suggested Budget

	Prop. & Part. % of Net Sales	Corp. % of Net Sales
NET SALES	100.0	100.0
COST OF SALES:		
Cost of materials used	52.0	52.0
Productive labor	18.0	18.0
Sub-contract costs	3.0	3.0
Total cost of sales	**73.0**	**73.0**
Gross profit	**27.0**	**27.0**
OPERATING EXPENSES:		
Advertising	.6	.6
Bad Debts	.1	.1
Communications	.4	.4
Depreciation	1.4	1.4
Dues & trade journals	.2	.2
Gas, oil, and service	1.5	1.5
Insurance expired	.6	.6
Interest & penalties	.3	.3
Legal & auditing	.3	.3
Misc. expenses	.4	.4
Non-productive labor	.6	.6
Office salaries & wages	2.4	2.4
Office supplies	.3	.3
Officers' salaries	....	6.0
Rent	1.0	1.0
Repairs	.3	.3
Shop supplies	.2	.2
Taxes & licenses	1.4	1.4
Traveling expenses	.2	.2
Utilities	.5	.5
Total operating expenses	**12.7**	**18.7**
Operating Profit	**14.3**	**8.3**

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Discussion Club

Journeymen Study Mutual Problems

SEATTLE—Keeping abreast of developments is not always an easy task for the busy serviceman, but a small group of journeymen here have organized an activity which takes a giant step in that direction.

Called the Associated Research Technicians of Mechanical Cooling, the group meets once a month to discuss specific subjects of mutual interest.

The activity includes the reading and discussion of articles in the NEWS and other industry journals, field trips, gathering of manufacturers' literature and data. Cooperation from the industry so far has been satisfactory, but could be more active, according to John F. Frangello, ARTMC chairman.

This discussion club approach is especially valuable in those areas where industry societies are inactive or inconveniently located. In addition, small groups of this sort can devote some time to specifics of general subjects discussed at society meetings, Frangello points out.

Contractors Hear about 'Silver Shield'

NWAHACA Tells Story at Meetings Across Nation

CLEVELAND—Heating contractors in all sections of the nation are listening with interest to the "Silver Shield" story dedicated to improve indoor comfort conditions and standards of installation, reports James D. Nolan, of the National Warm Air Heating & Air Conditioning Association.

On March 11, more than 150 Rochester, N. Y. contractors heard a full-scale discussion of the program. More than a third of them indicated interest in organizing a local Indoor Comfort Bureau to put a Silver Shield program into effect.

The program, briefly, calls for the identification of heating and air conditioning installations made according to NWAHACA

(Concluded on Page 4, Col. 3)

OHI Seattle Convention Program Set; Official Urges Upgrading for Industry

* * *

SEATTLE — Many topics covering wide aspects of fuel oil and oil-burning equipment will be discussed at the 37th annual convention of Oil Heat Institute of America, Inc., to be held at the Olympic hotel here April 28 to May 2.

During the five-day session there will be the annual meetings of OHI itself and its three divisions: Distribution, Manufacturer and Accessory, and Technical, as well as the OHI of Washington.

Problems of special interest to the Pacific coast will be discussed at various sessions, as might be expected, but a broad representation of speakers from the east and midwest is included on the program to make the convention national in scope.

(Concluded on Page 21, Col. 1)

* * *

MILWAUKEE — Stating emphatically that oil heat advertising and promotion are essential to the future of the industry, Charles H. Burkhardt, national secretary of the Distribution Div. of the Oil Heat Institute of America, told Wisconsin heating oil jobbers, distributors, and dealers that such promotion must, however, be accompanied by a general up-grading of performance throughout the industry.

The remarks were made by the OHI official in an address before the Wisconsin Petroleum Association at its annual convention held recently at the Shroeder hotel here.

"Promotion, including both advertising and public relations, is vital and essential to the future of oil heating," Burkhardt said, "if oil heat is to maintain its competitive status with other actively promoted fuels."

He said it is "imperative that constructive efforts be made throughout the industry to upgrade its service and performance, the quality and type of its installations, and the appearance and performance of all personnel appearing before the public, if this promotional effort is to be successful.

"When the public is thinking about oil heating with an emphasis that it has not done before, it will be far more conscious of any shortcomings of oil heating, if such exist."

(Concluded on Page 21, Col. 3)

Jan. Room Unit Sales Rise In 4 of 6 Areas

DETROIT—Sales of room air conditioners were off to a better start this year than in 1958 in four of six areas from which reports were received by the NEWS, with volume for January up from a year ago.

Dehumidifier sales, too, rose in some areas.

In the Greater Washington area, distributors' sales of room units (including 2 hp.) skyrocketed from 691 in January of 1958 to 2,311 in the same month this year, the Electric Institute of Washington reported. Sales of dehumidifiers also zoomed there, totaling 441 this January compared with 67 a year earlier.

Dehumidifier sales in the St. Louis area in January also topped the year-ago level. Union Electric Co. there reported that January shipments of dehumidi-

(Concluded on Page 21, Col. 4)

Buffalo Requires Contractor License For Home Heating

BUFFALO—Mayor Sedita has approved the residential warm air heating code recently enacted by the Council.

His action adds a new article to Chapter VII of the city ordinances which regulates businesses.

The new code provides for the licensing of residential warm air heating contractors. It covers all installations and replacements of space heating equipment on residential premises where "the B.t.u. loss is 250,000 units or less."

Standards are set up for installation of equipment to protect life and property from fire, gas fumes, explosions, and faulty installations. A $250 penalty for violation is provided.

John C. Quinlan, chief examiner of stationary engineers, and Chief Godfrey S. Uhrich of

(Concluded on Page 21, Col. 3)

Hydronics Sales Continue Rise

NEW YORK CITY—An upsurge in shipments of hydronic heating equipment which started in the summer months and continued unabated through the fourth quarter outweighed early losses and gave the industry substantial sales gains for the year 1958 over 1957, the Better Heating-Cooling Council reported.

At the same time, it was asserted that the nation's home builders were displaying a new attitude of intensified interest

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Typhoon To Bow Roof-Mounted, Air-Cooled Conditioner In 2 Sizes

BROOKLYN—A roof-mounted air-cooled air conditioner in 5 and 8-ton capacities will be introduced when Typhoon Air Conditioning Co. exhibits its 1959 line of air conditioners to New York metropolitan area architects, air conditioning contractors and dealers, and other members of the air conditioning trade Wednesday and Thursday, March 25 and 26, at the Statler-Hilton hotel.

The new unit incorporates features that make it suitable for use wherever a roof-mounted air conditioner will save valuable floor space and simplify installation, the company said in its announcement.

"It has a propeller type fan and vertical air flow not affected by wind velocity," the announcement stated. "Designed for front duct connections, it may be located anywhere on the roof, not necessarily directly over the space it serves.

"Elimination of bottom connections also permits placing the unit directly over a bearing wall and simplifies installation of tight, weatherproof flashing. Made with drop-out, weatherproof doors, the new unit may be serviced without removal of a single fastener," according to the firm.

Typhoon, a division of Hupp Corp., makes a full line of packaged air conditioners for commercial, residential, and industrial applications in sizes from 2 to 75 tons and self-contained heat pumps in 2, 3, and 5-ton sizes.

Burow Elected AFI President

PHILADELPHIA — E. F. Burow of Toledo was elected president of the Air Filter Institute at its annual meeting.

Other officers include E. F. Snyder, Minneapolis, first vice president; W. B. Watterson, Cleveland, second vice president; and Arthur Nutting, Louisville, secretary-treasurer.

Subjects discussed were a new code of ethics, Underwriter Laboratory standard and standardization of efficiency ratings, capacity ratings and test procedures for electronic air cleaners.

Members of the institute are continuing to provide financial support for the air cleaning research program of the American Society of Heating, Refrigerating & Air-Conditioning Engineers.

Lindustries Formed In Ft. Worth, Tex. To Make Automotive Air Conditioners

FORT WORTH, Texas—Lindustries, the newest name in the automotive air conditioning manufacturing business, has been announced by two men who helped pioneer the independent industry in 1949, O. P. Leonard and William E. Lind.

W. E. Lind

Leonard, Fort Worth merchant and industrialist, successfully marketed independently installed refrigerated air conditioning systems for passenger cars in 1949. The engineering and manufacturing was then and is now under the direction of Lind, who is general manager.

Manufacturing and executive offices are at 1041 Foch St., Fort Worth, where the original units were produced.

In announcing the new company, Leonard and Lind stated that Lindustries' Automotive Air Conditioning Div. will produce and market for the 1959 season a complete line of units for American and foreign cars, trucks, busses, heavy farm and road building equipment, and special custom applications.

According to Lind, Lindustries is presenting a new concept in car cooling. He noted that the firm's under-dash unit uses two squirrel cage type blowers.

Lind has designed an independently powered unit designed for trucks and heavy equipment which "promises to be popular in oil and gas exploration work," it was also noted.

Lind is past chairman of the Texas Section of SAE, is a member of ASRE and RSES, and a life member of American Ordnance Association.

Coleman Reports '58 Profit After Loss During '57

WICHITA, Kan. — The Coleman Co., Inc. resumed dividend payments on common stock with the declaration of 15 cents a share for the first quarter of 1959.

The dividend will be paid March 6 to stock of record Feb. 27.

The board of directors also declared a dividend of 53⅛ cents a share on preferred stock payable March 12 to stock of record Feb. 27.

Sheldon Coleman, president, reported operations had switched from a loss in 1957 to a profit in 1958.

In 1958, net profit after taxes was $769,257 or $1.78 per share of common stock. In 1957 the company had a net loss of $998,097 after income tax credits.

Sales last year were $35,729,726, an increase of $853,759 over 1957 sales of $34,875,967.

The board proposed an amendment to the charter of the company which would provide for increasing the authorized common stock from 400,000 shares to 1,200,000 shares; splitting the outstanding common stock on the basis of one additional share for each two outstanding shares, which would increase the present 400,000 shares to 600,000 shares; and clarifying the extent of preemptive right of holders of common stock.

The board also adopted a restricted stock option plan covering 40,000 shares of the company's common stock to be optioned to key executives including officers of the company and subsidiaries.

The charter amendment and the proposed stock option plan will be presented to the stockholders for approval at their annual meeting on May 19.

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WAY OUT IN FRONT and deservedly so!

KRAMER's largest UNICON has *50% more* capacity than any other! ▶ New, all aluminum casing ends rust and corrosion. Stands and structural steel are galvanized after fabrication. ▶Time-tested WINTERSTATS prevent low receiver pressure and insure start-up under any weather condition.

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WRITE FOR BULLETIN

KRAMER TRENTON CO./Trenton 5, N. J.

46 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

Be a giant step ahead of competition

SELL THE FIRST ROOM AIR CONDITIONER THAT THINKS!

THE CHRYSLER SLENDER. All-new—inside and out. Fits any conventional window without unsightly overhang. Delivers up to 10,000 BTU.

THE CHRYSLER HIGH POWER. Delivers more than twice the capacity of the largest thin unit . . . up to 21,000 BTU. Yet it actually takes up less window space.

The profit's great... and the selling's easy with these fabulous new Chrysler Air Conditioners

Biggest sales-building idea in room cooling since the electric fan . . . and it's exclusively for Chrysler dealers. Only Chrysler units with Climate-Minder* automatically, constantly balance temperature *and* humidity. They actually think for themselves to bring perfect climate—even on the muggiest days.

There's a model for every market: The Chrysler Royal Slender for maximum cooling in minimum space. The Chrysler Royal High Power for the south, and anywhere huge capacity is needed. And the Chrysler Royal Built-In for the custom look at an economy price. They're all beautifully designed by Chrysler's master stylists . . . and packed with features that sell.

New full-color advertising pre-sells your customers. New Co-op Fund strengthens your local advertising efforts. New incentive program offers extra rewards for volume selling. And new lower prices—averaging 15% less than last year—give you the best chance ever to cash in on a $480,000,000 market.

The dealer who sells Chrysler "Room Air Conditioners that Think" this summer will bank plenty of profit this fall. Want to earn your share? Contact your local Chrysler Airtemp Distributor. Or write: Airtemp Division, Chrysler Corporation, Dept. H-39B, Dayton 1, Ohio.

*Climate-Minder is standard on all Chrysler Slender, Built-In, and High Power 230 V. Royal models. The versatile Chrysler line for '59 also includes Custom models of the Slender, Built-In, and High Power, plus the exclusive Casement and Imperial Built-In series.

CHRYSLER AIRTEMP

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BIG business for you in 1959

I.M. Bodine Elected First President of Canadian Refrigeration, Cooling Group

BRANTFORD, Ont., Can.—I. M. Bodine, general sales manager of KeeRite Products, Ltd. here, was elected first president of the new Canadian Refrigeration & Air Conditioning Association.

I. M. Bodine

Other officers elected at the first general meeting of CRACA at the Alpine Inn in the Laurentian Mountains were:

J. B. Graydon of Toronto, first vice president; W. Smallwood of Toronto, second vice president; C. M. Fleming of Winnipeg, Man., treasurer; and T. W. McLorg, Toronto, executive secretary, the association said.

Approximately 100 Canadian companies have applied for membership in the nation-wide association, which will claim to speak for manufacturers, contractors, wholesalers, and supporting suppliers.

Each of these elements of the industry will comprise a separate section of the over-all association.

E. Pullen of Oakville, Ont., was named president of the manufacturers association; J. B. Graydon of Toronto, president of the contractors association; E. Horwood of Montreal, president of the wholesalers association; and L. Milligan of Brantford, president of the supporting suppliers association.

'Silver Shield' Presentations--

(Concluded from Page 1, Col. 5)

standards with a Silver Shield emblem. Local bureau would publicize Silver Shield quality installations, check plans before installation, and check system after installation to be sure it met approved requirements.

Most recent city to establish an Indoor Comfort Bureau to carry out the Silver Shield program is Lansing, Mich. A bureau has been in successful operation in Kalamazoo, Mich. for six months. Kalamazoo was the first city to adopt the Silver Shield program.

On March 19, Kalamazoo bureau officials Lewis Andrus and Harold Guernsey will tell the Michigan Sheet Metal Contractors Association convening in Detroit about their experience with the Silver Shield program.

The Kalamazoo bureau recently completed a two-months' long school where 25 contractors reviewed heating and air conditioning system design procedures outlined in NWAHACA manuals.

On March 25, the Silver Shield story will be told to the Pacific Coast Gas Association meeting in Sacramento, Calif. The presentation will be made by Roland R. Taylor, Emery Lillard, and Dar Knowles of the Warm Air Heating Institute of Northern California.

At Oakland March 24 a meeting beginning at 7:30 p.m. will be held in the new Builders Exchange at 321 E. 12th St., sponsored by Furnace Dealers & Sheet Metal Contractors of Northern California, John T. Banister, representative.

At San Jose March 26 a meeting will be held under sponsorship of Sheet Metal & Heating Contractors Association of Santa Clara County.

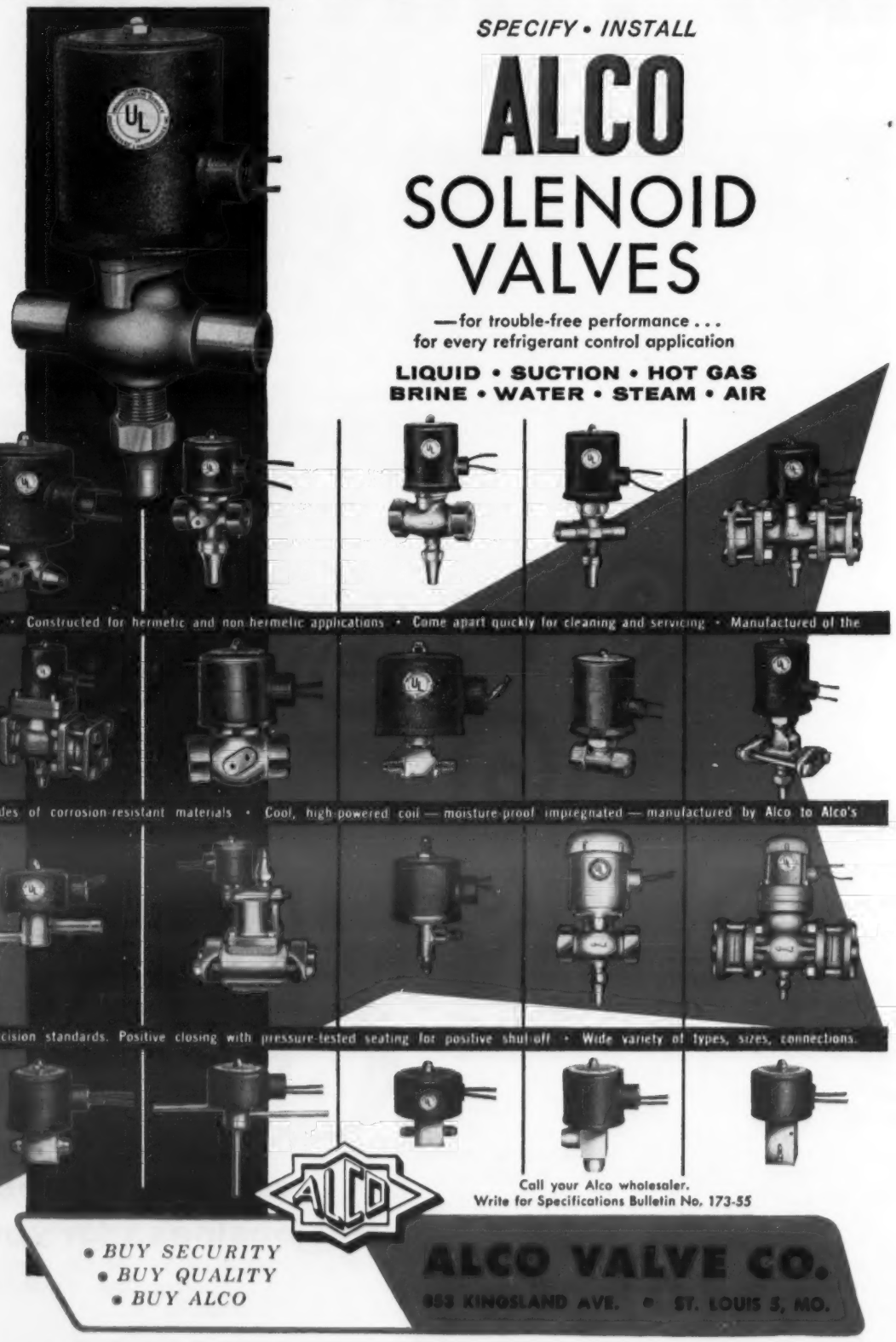
Meetings will be held in Marin county and in San Francisco.

Taylor announced that Randall A. Nelson, public relations director for the NWAHACA will be in San Francisco April 16 for ten days during which he will be available for meetings with members of the industry who wish to set up "comfort bureaus" for Silver Shield certification and inspection.

Nelson on March 9 addressed the 44th annual convention of the Sheet Metal Contractors Association of Wisconsin in Milwaukee. In February, presentations were made in Fresno, Stockton, Sacramento, and San Mateo, Calif. Modesto, Calif. heard about Silver Shield on March 10.

Nolan reported that Silver Shield activity is under way in Texas and there is evidence of interest in southern Florida.

He said NWAHACA hoped to have 20 to 25 solid, well-organized local Indoor Comfort Bureaus functioning by the end of the year.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Compact • Constructed for hermetic and non-hermetic applications • Come apart quickly for cleaning and servicing • Manufactured of the
best grades of corrosion-resistant materials • Cool, high-powered coil — moisture-proof impregnated — manufactured by Alco to Alco's
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Solenoid Valves Suction Line Regulators Flooded Evaporator Controls and Reversing Valves

Hydronic Sales--

(Concluded from Page 1, Col. 4)

and demand for hydronic heating.

Industry sales gains were seen in shipments reported for 1958 by the Institute of Boiler & Radiator Manufacturers, the Gas Boiler Div. of the Gas Appliance Manufacturers Association, and other informed industry sources.

Cast iron boilers were reported up 5%, baseboard radiation up 10%, and gas-fired boilers up 14.7%. Shipments of steel boilers and commercial finned-tube radiation were reported close or equal to 1957 shipments.

Year-end totals included conservative estimates of final fourth-quarter figures, it was pointed out. Incomplete fourth-quarter returns for 1958 strongly indicated major increases over the previous year's last quarter.

According to reports from BHC members exhibiting at the recent National Association of Home Builders' convention in Chicago, the home builder's buying interest in hydronics is decidedly on the upswing, the council noted.

Consensus is that a "striking breakthrough" into the new home market can be achieved by hydronics manufacturers, wholesalers, and contractors, BHC observed.

Following the NAHB Convention, BHC received this comment from a member who had exhibited at the show:

"Many builders said to us, 'Don't send me your literature, send me your salesman.' It was the best builder show in many years as regards to promotion of hydronics."

In a forecast of industry sales during 1959, I-B-R General Manager Robert E. Ferry predicted a gain of from 5 to 10%. "The expanding activities and efforts of I-B-R, BHC, and individual manufacturers should contribute largely to impressive sales advances this year," he said.

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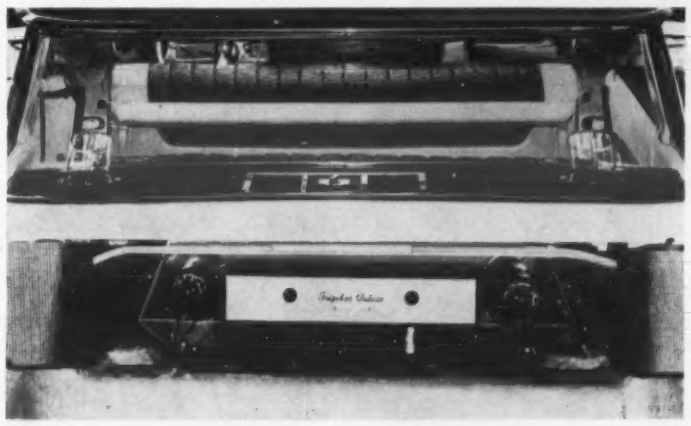

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For Commercial Air Conditioning

Veteran Contractor Sees Tremendous Potential In New York, But Also Cites Present Problems

By C. Dale Mericle

NEW YORK CITY — Market potential for air conditioning, especially package units, is continually expanding, believes veteran contractor Irving Forman, who started in the business 'way back when the public thought such a unit "was a magic box and that I was a magician," as he phrases it.

For example, Manhattan's famous Seventh Avenue garment district, which Forman helped revolutionize back in the Thirties by promoting and selling air conditioning, "is still 80% open yet," he believes. And this is the man who claims to sell and service more air conditioning in the garment industry than all other contractors combined.

Most of the air conditioning installed in the district, he explains, has been for the benefit of the offices and buyers, and this accounts for only 20 to 25% of the space; so, 75 to 80% of the space remaining offers a tremendous market.

"Some union leaders have told me that when they run out of other demands, they'll ask for air conditioning," Forman says.

Another important factor, adds Forman, who knows the industry thoroughly (years ago he was, in fact, a dress manufacturer himself), is that "few young people are coming into the garment industry today. The older workers want to retire, so air conditioning of the work space is being considered as an incentive to keep these older people working.

"And don't forget the replacement market, either," Forman emphasizes. "There have been a lot of units installed over the past 25 years that are due for replacement."

Computers Creating Another Big Market

Another big market for air conditioning is represented in the increasing use of computers and other electronic office equipment by businesses of all types, he's convinced.

"Today in New York no store dares open without air conditioning," Forman also says.

"Then there are the office buildings. Because sales and office space, in new buildings especially, are air conditioned, owners of older buildings are forced to air condition also.

"Studies indicate that rentals can be increased $1 per foot with air conditioning, while in brand new buildings rentals will run $2 to $5 a foot higher. Even more important, air conditioning lets the owner rent out space that might otherwise be vacant."

Forman also sees a good New York market developing among churches and synagogues.

While the immediate and long-range future look bright indeed to Forman, he points out that a contractor's life is not exactly a bed of roses.

"One of the big problems today is that air conditioning *is* accepted by the public, so no one tries to sell it at a decent profit; it's as bad as heating.

"I don't blame the buyer for today's problem," Forman goes on. "They're given a 'short course' by salesmen and in five days they think they know more about air conditioning than I do."

Forman doesn't think so kindly of general contractors, though.

"Most general contractors today will get 10 bidders on air conditioning, figuring that one of them is going to make a mistake in his bid, and he'll get the job. The guy who figures 2 plus 2 equals 3 will be awarded the air conditioning contract," says Forman, who pulls no punches in his conversation.

"In fact," he says, "I personally can't sell anyone until I call him an s.o.b., and then I either get thrown out or I get the order."

Recognizing that maybe all prospects won't care for the "direct approach," Forman depends on others for the more conventional sales "pitches."

Very definitely, he also points out, his firm—Forman Air Conditioning Co., Inc., a long-time Carrier dealer—is not a mechanical contractor.

(In Forman's opinion, "engineers can't run a business successfully; you can't make a profit with a slide rule.)

"We sublet everything we can, but service is a big and important part of our business. About 85% of our business," Forman adds, "is either repeat business or results from recommendations by customers."

Forman Air Conditioning concentrates on the commercial field in New York's five boroughs.

Staying Out of Residential Field

"We haven't gotten into residential," Forman says. "I feel you have to concentrate on it alone. It requires an entirely different approach in sales, installation, and service."

Although he has such big markets as the garment industry "sewed up," Forman is a strong advocate of advertising, especially outdoor advertising.

What is probably the largest outdoor sign in the entire air conditioning industry, manufacturers included, is maintained by Forman above New York's West Side highway. This painted sign is 200 ft. long. There are seven 24-sheet billboards in a row just below the Forman sign, but the latter is so big the conventional billboards look like miniature models.

Not only is this sign quite visible to traffic on the highway, but it's seen by every big passenger liner that docks here. Forman doesn't say whether it can be spotted from the Jersey side of the harbor without binoculars.

Besides this one, the company maintains four other signs in strategic locations on Manhattan, and is always on the lookout for additional locations.

Yet Forman does not go overboard on advertising expenditures. Maintenance of these signs, plus a certain amount of newspaper advertising, works out to about 1½% of sales, he indicates.

Now we're cooling with

GAS

A 22-foot wall of sheer glass . . . yet it's always cool inside! — thanks to **GAS**-operated Arkla-Servel air conditioning

The strikingly modern Hillside Church is one of four completely air-conditioned buildings located within Rose Hills, Southern California's beautiful memorial park. Because of the liberal use of glass walls, and the desire for one central system, the air conditioning installation presented unique problems.

After a careful study, the Arkla-Servel gas absorptive cooling system was chosen. "And we're completely satisfied," says John D. Grigg, President. "Our 25-ton gas unit produces 10,000 cubic feet of cool air per minute. And you can't beat it for economy. It requires practically no maintenance. Since it uses the same boiler, it makes use of our heating facilities on a year-'round savings basis."

Gas absorptive cooling can put your heating plant on a year-'round economical basis too. For specific information, call your local gas company, or write to the Arkla Air Conditioning Corporation, General Sales Office, 812 Main Street, Little Rock, Arkansas. *American Gas Association.*

GAS OPERATED ARKLA-SERVEL
ABSORPTION-TYPE WATER CHILLER

- lowest operating costs
- fully automatic operation
- long dependable service
- packaged construction
- compact size
- easy installation

Mich. Heating & Sheet Metal Assn. Will Meet In Detroit Mar. 18-20

DETROIT—The 48th annual convention of the Michigan Heating & Sheet Metal Association will be held March 18-20 at the Hotel Fort Shelby here.

The program indicates that conferees will learn how successful contractors make group advertising pay, operate a service department, analyze costs, handle telephone advertising, increase their sales, and set up and keep job cost records.

One highlight of the meeting will be a luncheon talk on Thursday, March 19, by J. B. Ogden, vice president-sales, Airtemp Div., Chrysler Corp. He will speak on "More Sales Per Man."

Registration is scheduled for 4 to 7 p.m. Wednesday, followed by a cocktail hour. Programmed for Thursday morning is an address of welcome by Gen. Clyde E. Dougherty, commissioner, Dept. of Buildings & Safety Engineering, Detroit; a history of the association by Homer Brundage, past president, who is board chairman of the Brundage Co.; and concurrent annual meetings of the association and the auxiliary.

Taking part in a panel discussion in the afternoon on "Modernization Is Profitable" will be Dan McCloskey, Midwest Heating & Service Co., Indianapolis, and Walter Marth, C. F. Marth & Son of Milwaukee.

Robert Sission of Michigan Bell Telephone Co. will then discuss "Better Selling by Telephone," after which there will be two more panel discussions —one on "Group Advertising" and the other on the "Kalamazoo Silver Shield Program."

Participating in the discussion on group advertising will be A. W. Keats, King Cole Heating & Cooling Corp., Detroit; George Asher, Better Heating & Cooling Bureau, Detroit; and Vic Benjamin, Jaqua Co., Grand Rapids. Lewis Andrus and Harold Guernsey, president and vice president, respectively, of the Kalamazoo Indoor Comfort Bureau, will describe the Kalamazoo program.

A "Mystery Bus Ride" feature (dinner and floor show included) has been scheduled for Thursday evening.

On Friday morning, Homer Brundage will discuss "General Business Costs"; Walter Reckinger of Reckinger Heating & Cooling Co. will cover "Records and Job Costs"; and Harold Bowie, president of the Detroit Warm Air Heating Association, will speak on "Operating a Service Department.

In the afternoon there will be a panel discussion of "What Should Be Expected by: Contractors from Suppliers and Manufacturers; Manufacturers and Suppliers from Contractors." On the panel will be Dee Cramer of Flint, association past president, and R. H. Pettinga, vice president and general manager, Hopson-Bennett, Grand Rapids.

Then will come a presentation, "Thar's Gold In Those Hills," by Henry Delnay, past president from Grand Rapids.

H&A Adds New Chapter

PINEHURST, N. C.—Dealers in the Southern Pines-Pinehurst area have formed a local chapter of the Heating and Air Conditioning Research and Development Association.

J. Ellis Fields is president of the new chapter; Martin Parrish, vice president; A. H. Garrison, secretary-treasurer; and Fred L. McKenzie, assistant secretary-treasurer.

Frigikar Purchases Allstadt Air-Con Div.; To Market Service, Installation Machines

DALLAS — Frigikar Corp., manufacturer of automotive air conditioners, has purchased the Air-Con Div. of Allstadt Mfg. Co., according to Bert J. Mitchell, Frigikar's president.

In addition to its regular line of passenger car, truck, and bus air conditioners, Frigikar will manufacture three improved models of Air-Con machines for servicing and installing all makes of automotive air conditioning, the announcement said.

Frigikar Air-Con equipment will be marketed through Frigikar's distributorship network.

North Carolina Exam

RALEIGH, N. C.—Examinations for refrigeration contractor licenses will be given here April 13, announces the North Carolina State Board of Refrigeration Examiners. Application to take the exam must be filed by April 6.

Flexible Tubing Names Stevenson

GUILFORD, Conn.—Appointment of Robert H. Stevenson, Jr., as manager-air conditioning sales, for Flexible Tubing Corp. has been announced by Frederick K. Daggett, company president.

Stevenson will be responsible for directing the sales of Flexible's "Thermaflex" ducting through the company's air conditioning representatives in the United States and Canada. He was formerly general manager of Hanover Industries.

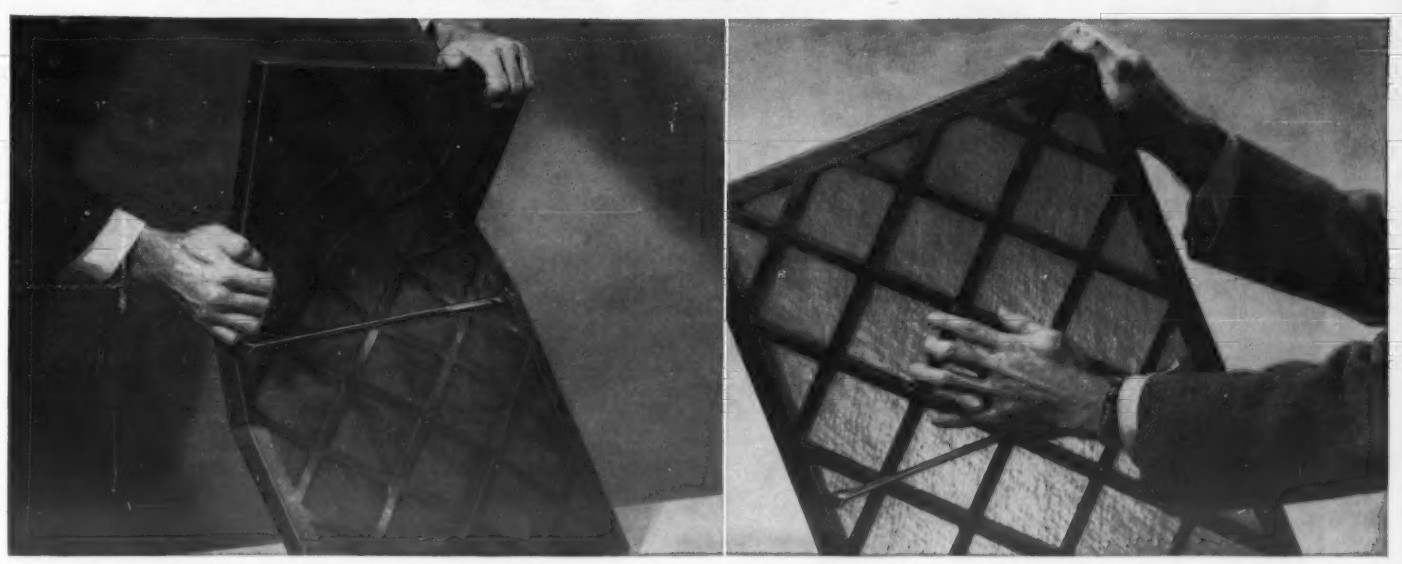
PROVE IT TO YOURSELF

...how much stronger...how much safer

Glasfloss® fiber glass Safety-Grille* filters really are

*TRADE MARK

MAKE THESE TESTS...



1. Bend it—and the new Glasfloss Safety-Grille Filter bounces right back to its original shape. Old type metal-grille filters don't. Unless you re-bend them, they stay bent out of shape and can cut down filtering efficiency. Strong construction of Glasfloss Safety-Grille Filters means less chance of damage in transit, in storage, in handling.

2. Feel the grille edge—it's chipboard, and perfectly safe! No sharp edges—no cuts, no scratches to worry about!

For maintenance personnel, the new Glasfloss Safety-Grille eliminates any danger of cut hands or wrists and possible infection when changing filters.

Plus these features... Glasfloss Safety-Grille Fiber Glass Filters . . .

—have same available filtering area and initial pressure drop as old-type filters
—are tested and proven in service
—are approved by Underwriters' Laboratories, Inc.

Make these tests: Try PPG's new Glasfloss Fiber Glass Safety-Grille Filters in your heating and air conditioning systems. Get top filtering results! They're available in a complete range of sizes from your local distributor or PPG Warehouse.

A Product of Pittsburgh Plate Glass Company

Sales Offices are located in the following cities: Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh and St. Louis

FIBER PPG GLASS PITTSBURGH PLATE GLASS COMPANY

Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

search. Forty per cent of these companies had 1956 sales volumes of more than $100 million; 27% had sales of $25 million or less.

More than three fifths of these 195 companies have at least one full-time marketing research employe. Slightly more than a fourth assign the responsibility on a part-time basis, more often to a line executive than to a staff executive.

Most of the others either assign it to an outside agency or divide it.

The use of marketing research on a full-time basis has increased more than 500% since World War II among the companies surveyed. Dates on which the function was first established as a full-time activity were given by 107 companies; only 19 of them cited a date as early as 1940.

Accompanying this over-all growth in organized marketing research has been a gradual increase in the number of small companies with full-time personnel engaged in this activity.

Among the organized departments established before World War II not one was a firm whose 1956 sales volume was $25 million or less. By 1951 a sprinkling of small firms had such departments; from 1952 to 1957 the number of organized departments in the small companies surveyed increased nearly 300%.

However, the employment of full-time specialists in marketing research still is much less frequent among small companies than among larger ones. Only 21% of the small-company participants in the survey make marketing research a full-time activity, compared to 66% of the medium-sized companies and 88% of the large ones.

Full-time specialization is found in 65% of the industrial-goods manufacturers surveyed, 54% of the consumer product manufacturers, and about 70% of the companies that produce products of both types.

Consumer-goods manufacturers tend to spend more on marketing research than do industrial-goods makers.

Eighty-four companies reported the percentage of their gross sales dollar spent on marketing research in 1956. The median figure for the consumer-product manufacturers was 0.2% of sales; for industrial-goods manufacturers, 0.1%.

Sales volume is the most important factor in determining the rate of expenditure on marketing research, the report indicates.

Generally speaking, small firms show the highest ratios of marketing research expenditures to sales.

This occurs because the basic cost of a marketing research department constitutes a significant percentage of total sales in a small company.

Interim Smile

Among expense account stories, this is Jim Bishop's favorite. It concerns a young sportswriter who was sent by a New York newspaper to a cockfight in Paterson.

Cockfights are illegal, and it required a little delicacy to get this story. The plot went something like this:

Ferry and train to Paterson, N. J.	.54
Room at Hotel Alexander Hamilton	4.50
Met guide in bar. He drank a pint. I had coffee	7.10
Dinner for two	6.30
Tickets to cockfight	8.00
Fix for two cops	10.00
Cab to and from cockfight	2.40
Room for guide	4.50
He couldn't sleep; accompanied him to speakeasy; he drank whisky; I had coffee	13.00
He picked up two girls; steaks for four	12.00
Fix for room clerk	5.00
Breakfast for two	1.80
Ferry and train to New York	.54
Total	$75.68

The city editor read it, smiled, and okayed it. Then he had a photographer make copies of it and it was hung all over the city room.

"In our midst," he wrote across the bottom of it, "we have a novelist of promise."

Quotes of the Week

One of the ingredients in my prescription is for the executive to have a "mission"—beyond the job, beyond himself, in which he believes and which will make his part of the world a bit better for his being in it.—DR. WM. C. MENNINGER.

If you attend to your work, and let your enemy alone, someone else will come along some day, and do him up for you.—E. W. HOWE.

" 'If everybody minded their own business,' the Duchess said, in a hoarse growl, 'the world would go 'round a deal faster than it does."—LEWIS CARROLL.

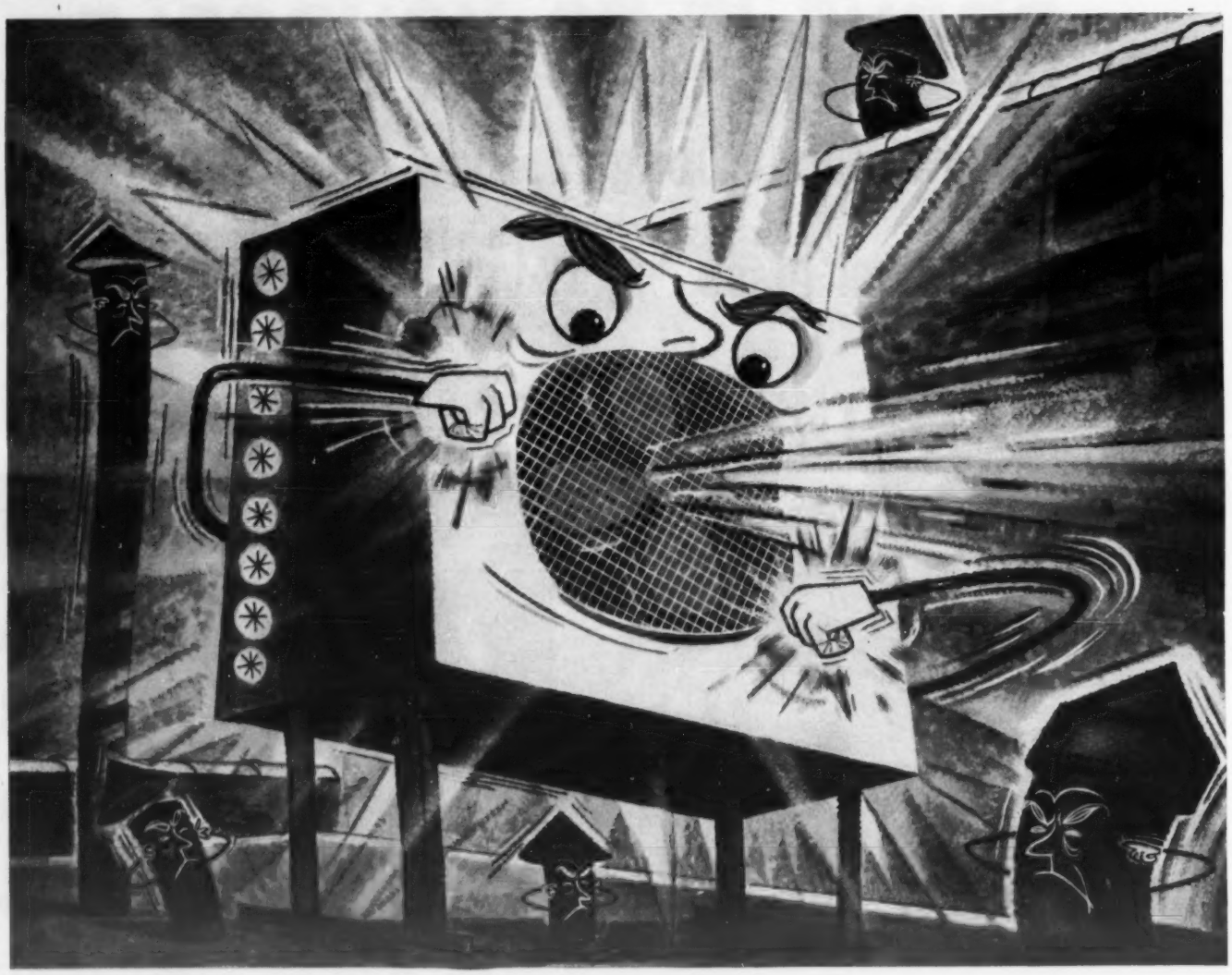
Remember that just a little thrift is a very pleasant flower to wear in your buttonhole and it gives you and yours a comfortable feeling of confidence. —URSULA BLOOM.

If we can't be thankful for what we receive, we should be thankful for what we escape. —ARNOLD H. GLASOW.

It's a tough world for the American businessman. Every time he comes up with something new the Russians invent it a week later and the Japanese make it cheaper.

What you like best, while you're sinking your taste-buds into a delicious dinner, is a television commercial depicting liver-bile flow.

It is the misuse of human power which we have most to fear.—GEORGE ROMNEY.



BEFORE YOU BUY, THINK:

Will your air-cooled condensers sound like thunder?

Not even from close up if they're by Halstead & Mitchell

Fan noise, vibration and rattling have been engineered out of H&M air-cooled condensers. Deep pitch fans are run at slow speeds. Casings are rugged; won't loosen with use.

H&M condensers are completely dependable. The large coil and exclusive Turbu-Flo fins improve heat transfer by up to 15%. Fins are spaced widely to avoid clogging by dirt and other air-borne particles.

Winter operation is easy, too, with H&M's special modulating valve. Halstead & Mitchell air-cooled condensers are available in propeller fan or blower models. Multiple circuiting at no extra cost. Ask your local distributor for complete information, or write to Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.

H&M AIR-COOLED CONDENSER

HM Halstead & Mitchell

Water-Cooled Condensers · Cooling Towers · Air-Cooled Condensers · Finned Coil Products

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Hangers

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Outserves! Outlasts!

In Zinc-plated Steel and Everdur. All sizes. Insulating bushings available. Top quality. Permit quick wiring. *Send for literature.*

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TECHNICAL CENTER

By Frank J. Versagi, Technical Editor

'Can I Charge Liquid Into Low Side?' (2)

(A Review of Refrigerant Charging Procedures)

LOW-SIDE LIQUID CHARGING

Low-side liquid charging can be applied to some hermetics, some semihermetics, but not to any open-type reciprocating compressors. Physically, the limiting factor is the path the refrigerant must travel before it can reach the compressor valves and cylinders.

In most dome-type hermetics, for example, where the charging connection is on the suction side, the liquid refrigerant passes over the windings before reaching the functional components of the compressor. With the compressor running, or not, the heat in this mass is enough to vaporize liquid refrigerant before any slug can reach critical areas—so long as liquid is not feeding too rapidly. In many cases, relatively small charges can fit completely into compressor bodies.

Thus, although Tecumseh does not recommend liquid charging into its compressors, it is an open secret that some companies which use these pumps on packaged equipment charge liquid into the low side on a production line basis.

Bryant Mfg. Co., Indianapolis, recommends a field charging method which makes use of a charging cylinder to assure proper weight of refrigerant, which is charged as liquid into the low side. Bryant's procedure (follow on Fig. 1):

After evacuation, purging, and re-evacuation, close valve D. Open valves C and E and fill the charging cylinder with specified amount of refrigerant. Close valves C and E.

Open valve B and allow liquid refrigerant to enter the compressor. If vacuum on the system is broken before complete charge is in the unit, the compressor can be operated to pump in the remainder of the refrigerant.

Close valves A and B; operate the condensing unit for 30 minutes. Check for leaks.

Some semihermetic compressors cannot take liquid into the low side because the path to the valves is too direct, but in many gas-cooled compressors—where the refrigerant must pass over a mass of windings and solid matter from which it can extract heat before reaching the valves—it is possible to charge liquid into the low side, although most companies are reluctant to suggest such a procedure.

One firm, which recognizes that experienced servicemen will liquid charge in the field, suggests that they use at least 6 ft. of ¼-in. charging hose to act as somewhat of a metering device.

Another package manufacturer which teaches low-side liquid charging on semihermetic compressors whose manufacturer frowns on the practice uses the following procedure:

After proper evacuation and purging, open low-side manifold valve one-half turn.

Place refrigerant cylinder in position to discharge liquid.

Open cylinder valve and if unit has been stopped place it in operation. If necessary, jack the low-pressure switch to keep unit operating.

Charge refrigerant until sight glass shows no bubbles. Then stand the cylinder upright and close cylinder valve.

Close valve on low side of manifold, and remove any jack used on the pressure switch.

The thing to guard against in low-side liquid charging is too rapid an entry of the refrigerant. Since this method is used to save time, the serviceman's attitude may be such as to make him careless of this important fact, in which case he'll be sorry. Proven abuse of a piece of equipment makes for a lively discussion of warranty applicability.

And while overcharging can be prevented by watching the sight glass, a more certain method is to weigh in every charge where there is a case history on the system.

Liquid charging into low side can be done, is being done. But companies are reluctant to see the method used generally for quite logical reasons. Bendix-Westinghouse is somewhat more liberal in this regard. It allows liquid charge into low side on any of its systems having a limited charge of not more than 2 lbs. of R-12 or 22.

Slightly different from charging directly into the compressor is the technique of charging liquid into the evaporator, the thought being to give the refrigerant more time to vaporize before it reaches the compressor. In many instances, this technique will call for line openings and valving which are not otherwise necessary and ordinarily undesirable.

Charging liquid into evaporators is used frequently on flooded chillers after first charging with gas until pressures are high enough to prevent freezing of water in the chiller.

No serviceman should take it upon himself to adopt low-side liquid charging without proper training or advice from a more experienced mechanic or at least some experimentation in his own shop with his own, not his customer's equipment.

Next: High-Side Liquid Charging

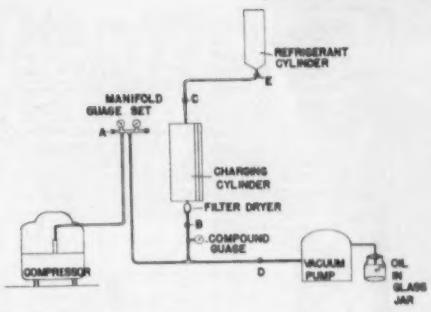
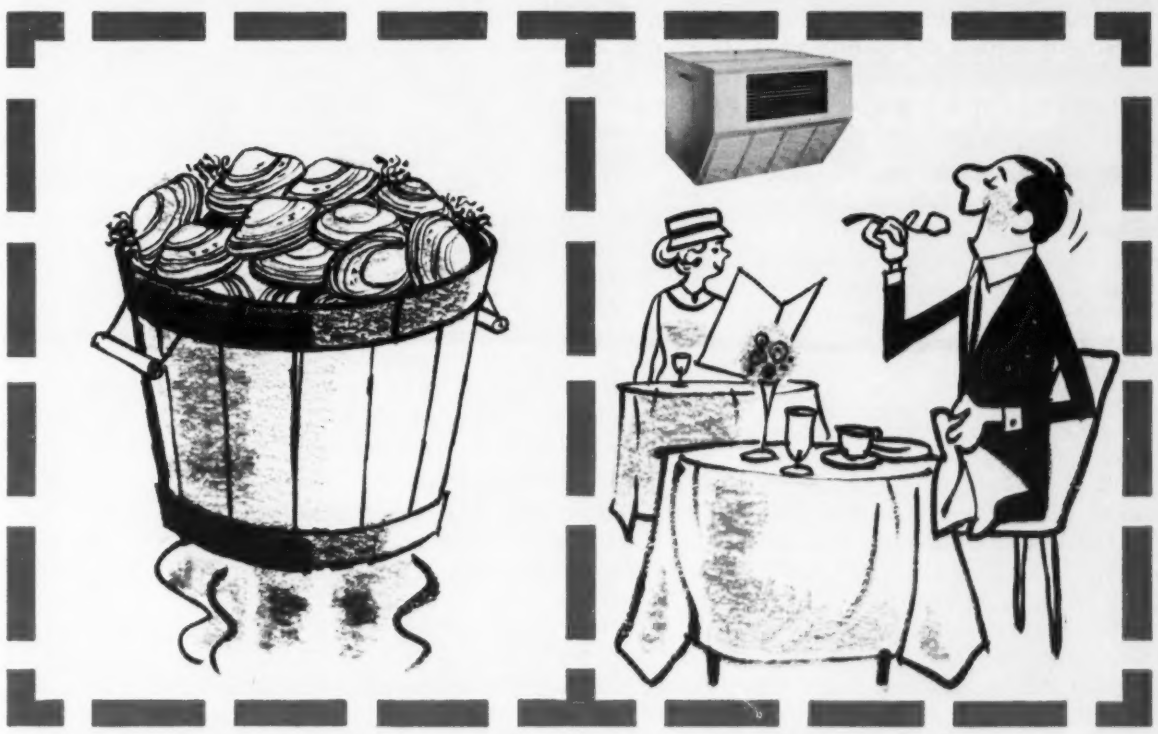


FIG. 1—Liquid refrigerant charging procedure used by Bryant Mfg. Co.

"Clammy Cool" is for seafood-*not people!*



Frigidaire advanced dry-cooling

offers new business conditioning sales possibilities

In '59, and the years to come, more and more business firms will think first of Frigidaire Air Conditioning. Why? Because Frigidaire has built a *big new difference* into air conditioning requirements—Dry-Cooling! Now, Frigidaire offers you perfectly balanced cooling and dehumidification in a complete line of air and water-cooled units and components. Now, you can install *true* air conditioned comfort, "cooling without clamminess", to please the most demanding of prospects. This is air conditioning designed for *people!*

More sales possibilities? You bet! Your best prospects will be pre-told about Frigidaire's advanced concept in business conditioning by provocative advertising in big-circulation business publications. And—you can bid profitably on more installations, thanks to full Frigidaire flexibility.

Learn more about Frigidaire Dry-Cooling. Call your Frigidaire Distributing Headquarters or write Frigidaire Division, General Motors Corp., Dayton 1, Ohio, for fact-crammed literature and sales programs designed with you in mind.

Here's what we mean by FRIGIDAIRE FLEXIBILITY!

Trans-Wall Units with new furnaces
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Coil-Blower Units hung from the ceiling
Cooling Coils with furnace or duct
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PLUS eleven Room Air Conditioner models and a complete line of furnaces.

designed with your business in mind Frigidaire Dry-Cooling...

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cools, cleans, and dries the air!

They'll Do It Every Time

by

Jimmy Hatlo

HI! WELCOME TO THE SALT MINE··· I'M AL ANGLEWORM··· I WANT TO WISE YOU UP TO SOME OF THE PHONIES IN THIS JOINT. STAY AWAY FROM HEMLINE, OVER HERE··· HE'S AN OLD BUDDY-BUDDY··· ALWAYS SHOWING OFF··· DOING A LOT OF WORK··· AN' WATCH OUT FOR THAT GUY FOOSTER··· HE'S A MOOCHER··· NEVER PAYS BACK···
ANGLEWORM'S GOT A NEW EAR TO WORK ON··· HE COULDN'T WAIT FOR THE NEW GUY TO TAKE HIS COAT OFF BEFORE HE STARTED WITH THE HAMMER THROWING···
NOBODY ELSE WILL TAKE TO ANGLEWORM··· EVEN THE SHOESHINE GUY GAVE UP TRYING TO COLLECT FROM HIM···
THE NEW GUY WON'T WISE UP TILL ANGLE PUTS THE BITE ON HIM FIRST PAY-DAY····
THE OFFICIAL GREETER HAS TO SHOW THE ROOKIE THE RIGHT PLACES TO EAT AND DRINK, TOO··· WONDER WHO'LL PICK UP THE TABS···
JIMMY HATLO
9-30
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WATCHING THE OFFICE SLYPANTS MOVE IN ON A PROSPECTIVE CO-SIGNER
THANX AND A TIP OF THE HATLO HAT TO HAROLD O. ANDREW, VERO BEACH, FLORIDA

How To Make Friends, Enhance Profits, Save on Income Taxes, And Insure World Peace

WORTHY of your attention is H. R. 5, the Boggs Bill, which would "amend the Internal Revenue Code of 1954 to encourage private investment abroad and thereby promote American industry and reduce government expenditures for foreign economic assistance."

Is it your notion, perchance, that this proposed legislation is remote from your own business problems? Think again!

American manufacturers and exporters have argued for many years that U. S. taxation of income from foreign investments is costing *all* American domestic taxpayers heavy money.

In support of this view is the fact that U. S. corporate foreign investments contribute importantly to economic development abroad—hence reduce the need for our personally taxed (they comprise a big part of your income tax bills) Foreign Aid give-aways.

Adequate revisions in the tax structure would help to reduce substantially the need for personal income tax money (yours and mine) to be expended by the billions for be-friendly-to-America handouts.

Earlier efforts to provide tax relief for investors in world commerce have failed for two reasons: (1) the business community could not agree on necessary measures, and (2) the United States Treasury naturally opposed any reduction of revenues.

The Boggs Bill is the first serious attempt at providing useful incentives for building foreign trade.

Incidentally, American Labor may be pricing exported American goods out of world markets—but not American products themselves. By investing in factories abroad, American manufacturers slash production and tariff costs. Thereupon U.S.A. products more than hold their own.

This legislative measure permits the establishment of U. S. branches abroad which would derive their income from sources outside the U. S., and which could defer payment of their American income taxes until such income actually is distributed to stockholders.

Therefore, it would eliminate the need for continued use of so-called "tax-haven" companies established in tiny principalities such as Panama, Liberia, and Puerto Rico.

That bill also would permit the transfer of foreign business property from one nation to another without the corporation in question being accused of tax avoidance. This is a form of transaction which currently requires advance rulings (too often adverse) by the Internal Revenue Service.

Said Boggs go-get-the-business bill also would extend the Western Hemisphere Trade Corporation tax reduction credit of 14 percentage points to all "International Trade Corporations."

Those companies which are able to meet slightly revised requisites for the present W.H.T.C. (but applied, of course, on a world-wide basis) thus would be in the clear to assist needy nations in Africa, the Near East, and the Orient in their economic development programs.

In addition, this bill would permit a world-trade-minded company to choose a more favorable method of computing tax credits (arising out of foreign income taxes paid in more than one country) than presently is available.

Briefly, it would avoid double and triple taxation of profits thereby.

Another important section of the Boggs Bill would allow trade-not-aid people to take advantage of tax waivers offered by all nations which provide inducements to American manufacturers which desire to build and sell their products abroad.

Under present U. S. tax laws, such inducements have meant little, inasmuch as the U. S. Treasury can collect taxes on all amounts which are not levied abroad up to the 52% level.

Boggs Bill also would remove "a discrimination in the tax treatment of gains realized from insurance proceeds by domestic corporations through the extension of similar treatment to an American owned foreign corporation."

Although the preceding remarks may seem involved and possibly esoteric to non-manufacturing readers, they do spell TAX SAVINGS to every "average American." And who among us isn't screaming about rising taxes?

How will the Boggs Bill cut *your* personal income tax bill? By slashing the billions we are forced to give away abroad annually to prop up "friendly" allies.

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'The Conscience of the Industry'

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VOLUME 86, NO. 11, SERIAL NO. 1,564, MARCH 16, 1959

SAYS PUBLIC ABUSES LONG WARRANTIES

William A. Schwarz & Son, Inc.
Air Conditioning Contractor
New York 16, N. Y.

Editor:

Recently you printed a letter written by a B. C. Clinard, president of Clinard Electric Co., regarding 12 months of service required of dealers on air conditioning equipment.

We wish to go on record as agreeing wholeheartedly with the article and an effort should be put forth to have both the 1-year guarantee period shortened to 90 days, and the 5-year warranty reduced to 1 year maximum.

We have been in the room air conditioner business since its infancy, and have records, which definitely show abuses by the general public.

It not only creates the loss of profit on the sale of the product, but also the ill will of the consumer towards the dealer and the manufacturer.

The above reaction is not only ours, but that of most specialists around New York, as indicated at many meetings.

WILLIAM A. SCHWARZ, JR.,
Vice President

SUGGESTS SIMPLER NAME FOR ASHRAE

Copeland Refrigeration Corp.
Sidney, Ohio

Editor:

Your editorial concerning the merger of the Heating & Refrigerating Engineers is certainly well taken. The merger should result in substantial benefits, not only to the engineers involved, but particularly to the industry.

I, too, believe that the merged group should develop a simpler name which would adequately define the society. Your suggestion of "American Society of Temperature Engineers" is worthy of consideration.

However, I would like to point out that it would bring about alphabetical conflict with the American Society of Tool Engineers, of which I am also a member. In other words, ASTE would be the symbols for both.

H. C. MCMILLEN,
Manager of Operations

Editor's Note: How about ASAE (American Society of Air Engineers)?

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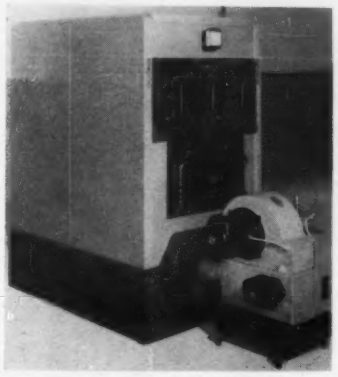


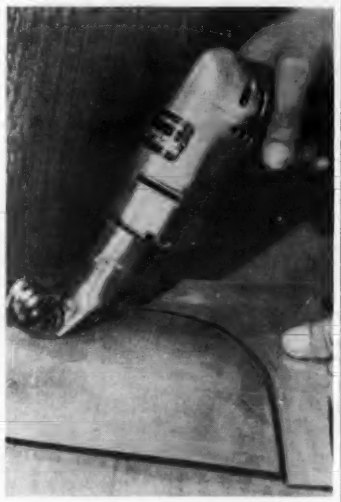
Boiler-Burner Unit Features Economy

● The operating economy and higher heat values of #4 or #5 fuel oil are available, "at a reasonable first cost," for small commercial buildings in the new Smith-Mills 25J4 boiler-burner unit, according to The H. B. Smith Co., Inc., Dept. AH&RN, Westfield, Mass.

The 25J4 is a new edition of the Smith-Mills 250 Series cast iron water tube boiler and is furnished as an integral unit complete with burner, prefab combustion chamber, and controls.

"Lower first cost is achieved by using a gun-type oil burner which preheats and then atomizes the oil before burning," the announcement said.

"Service required is about the same as an ordinary domestic size gun-type burner."



Sheet Metal Shear Attaches to Drill

● Development of a new sheet metal shear has been announced recently by the C. W. Lind Co., Dept. AH&RN, P. O. Box 7501, 4912 France Ave. North, Minneapolis 22.

Called the "Docken Shear," the unit "attaches easily to leading industrial type ¼-in. drills by merely removing the drill chuck and replacing it with the complete, self-contained Docken unit," the manufacturer said.

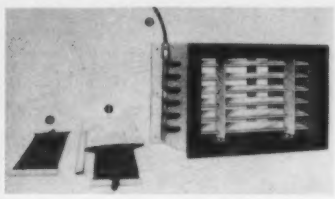
"The shearing blade, mounted between two cutting knives, is given the cutting action of a scissor through an eccentric bearing arrangement on the drill's drive assembly.

"Radial cuts on metal sheeting from 16 gauge aluminum to 22 gauge stainless steel are possible, without distorting the material. Because the Docken Shear has a scissor point, inside cuts can be made by merely drilling a starter hole.

"The blade is fully adjustable to allow clean cuts on light to medium material, with a heavy-duty blade available as an accessory for cutting heavier material."

List price is $36.

High Velocity Valve Needs No Motor, Linkage



● Connor Engineering Corp., Dept. AH&RN, Danbury, Conn., offers "Pneumafoil," a high velocity air valve which operates without motors or linkage mechanism.

Operation is by a 15 p.s.i. pneumatic control system.

"Each of Pneumafoil's airfoil type vanes encloses a sealed neoprene actuator connected to control air," it was explained. "As air pressure is increased, the actuators inflate and expand the vanes, constricting the open area between the vanes and throttling the air flow. When the expanding vanes make contact, complete shutoff with minimal leakage is achieved.

"Airfoil type vanes minimize noise when throttling, and have low pressure drop in full open position. Their aluminum construction prevents corrosion."

For dual duct applications, two Pneumafoil valves are mounted in a mixing box.

Pneumafoil valves are fabricated in 16 sizes which range from 10 in. by 6 in. to 32 in. by 24 in. Air capacities range from 1,500 to 9,600 c.f.m.

Want More Details?

ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.

Tell him: "AH&RN sent me!"

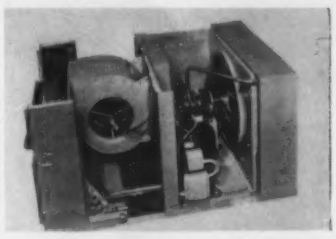
Addison Announces New Packaged Heat Pump

● Release of a new line of packaged air-to-air source heat pumps has been announced by Addison Products Co., Dept. AH&RN, Addison, Mich.

"Available in 2, 3, and 4-hp. sizes, the model PA22H delivers 22,000 B.t.u. heating, and 22,000 B.t.u. cooling; model PA30H delivers 27,000 B.t.u. heating, and 30,000 B.t.u. cooling; and model PA40H delivers 38,000 B.t.u. heating, and 40,000 B.t.u. cooling at rating conditions," the announcement said.

"Also available with these units is an accessory return air grille and directional discharge plenum for discharging either the heated or cooled air into a given area. This allows great flexibility for commercial application, etc.

"Supplemental heat kits ranging in size from 8 kw., 12 kw., and 16 kw., delivering 25,000, 37,500, and 50,000 B.t.u., respectively, are also available. The kit attaches directly to the discharge of the reverse cycle unit."



Addison Products is a contract manufacturer of central cooling equipment and window air conditioners, as well as refrigeration cycles for beverage coolers, dehumidifiers, bulk milk coolers, and specialized refrigeration apparatus.

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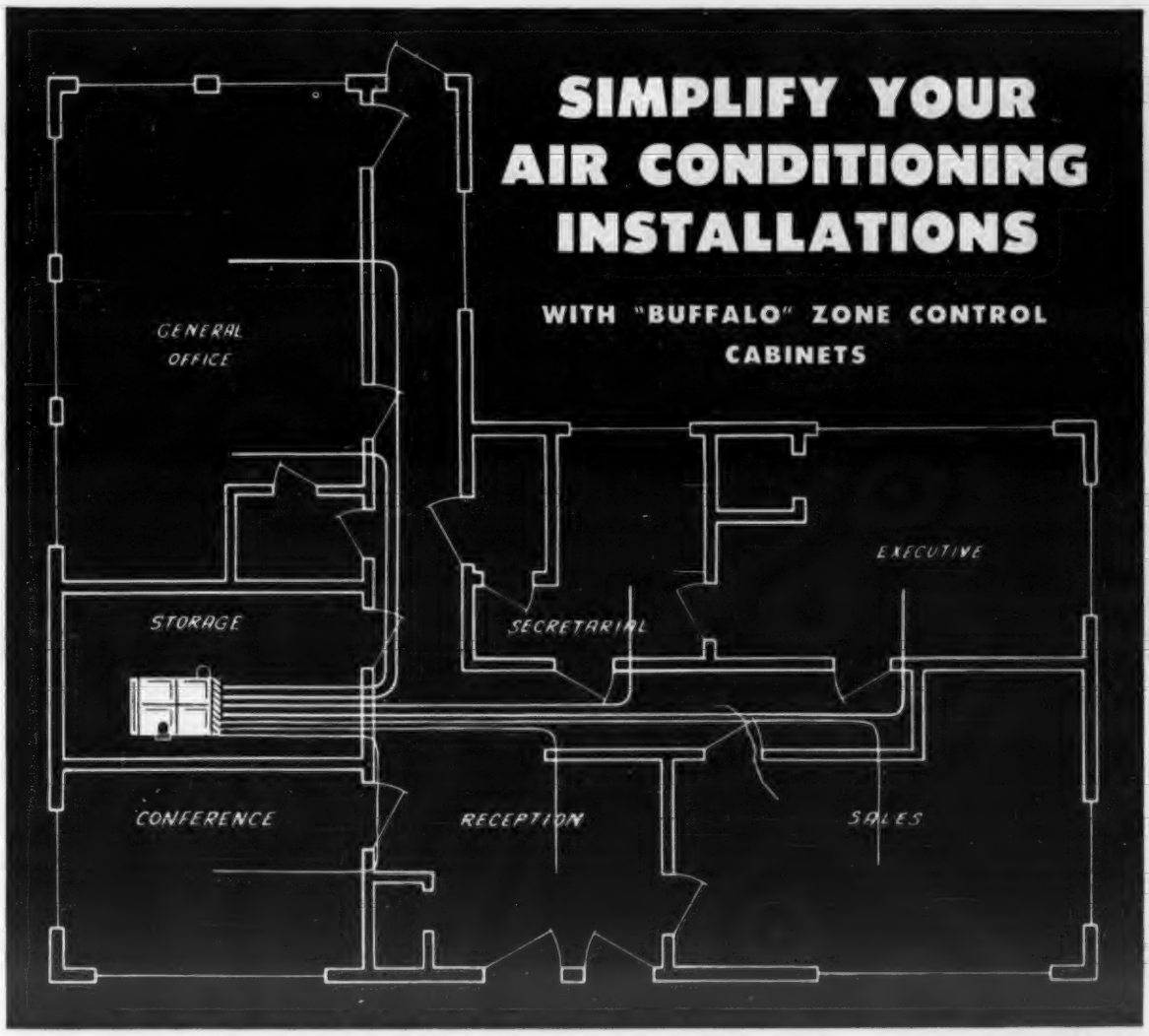

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- Convenient to service — handy access doors, removable panels and outside-located bearings simplify servicing needs.
- Flexible — many combinations available — optional floor or ceiling mounting clips available; can be adapted to any combination of heating, cooling and/or dehumidifying.
- Space-saving design — unique coil angle permits maximum coil face area within minimum headroom and length.

Investigate the many advantages of "Buffalo" Zone Control Cabinets. Call your "Buffalo" engineering representative, or write for Bulletin AC-220.
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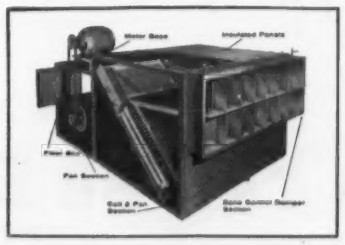

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Biggest Problem for Long Island Contractor Isn't Selling, It's Financing Builders

By C. Dale Mericle

VALLEY STREAM, N. Y.— Doing 95% of its business in the new home field and dealing almost exclusively with builders, a large heating and air conditioning contractor operating in this Long Island community finds its biggest problem is financing the builder.

At least, that's the opinion of Sidney Kaminsky, who with partners Mort and Sam Goldberg, heads up City Sheet Metal here.

"We could easily increase our business 50% a year, but we wouldn't be able to finance it," Kaminsky says. "So we're looking ahead to get a 50% increase over the next five years, say."

Since they started the business 11 years ago, the three partners have developed it to the point where in 1958 they did better than 2,000 homes, and of these almost 200 had year-round air conditioning systems.

'59 Looks Better Than Good '58

Although last year was one of the firm's best, the outlook for 1959 seems even better. It's likely to develop into quite a rat-race, however, for both Kaminsky and Frank Bittner, York zone manager, point out that while many building projects are already completely sold out, construction has been delayed considerably by the unusually long and cold winter.

"The ground is frozen 3 ft. deep hereabouts," they explain.

So when the builders are able to start construction, everyone will want everything at the same time probably.

In the past few years all builders hereabouts, including those with excellent financial backing, have gotten into the habit of letting the heating and air conditioning contractor finance his installations.

"On the average, builders pay up on a 90-day basis, and it often runs longer," Kaminsky explains, and equally important is that he almost always has to go out to collect the money. It's a rare builder who mails his check to the heating contractor, Kaminsky has found.

What with employing 45 mechanics (as many as 80 in peak season), and doing projects involving as many as 750 to 1,500 homes, usually spread over two or three years, City Sheet Metal obviously has to give much thought and attention to financing its and the builders' operations.

This is where Kaminsky concentrates most of his efforts while partner Mort Goldberg does most of the selling and Sam Goldberg supervises the installations.

The firm originally started 11 years ago as a sheet metal contractor, but it soon got into heating as well and then moved into air conditioning. While just about all of its work goes into homes, it does an occasional commercial job. The latter usually comes about because the builder for whom City Sheet Metal is doing the homes also wants the firm to take care of the shopping center he's putting up in the project.

Growth of the firm reflects to a considerable extent, no doubt, the swing to warm air in this area, Kaminsky believes.

"Back in 1950 80% of the jobs were hot water systems; now about 70% are warm air," he says.

Work Limited to More Expensive Homes

Thus far the firm's air conditioning installations have been limited to the more expensive homes, Kaminsky indicates. Rarely is it installed in homes costing up to $18,000, but in the $26,000 and up bracket about 20 to 25% have air conditioning, he estimates. Some developments, however, are 50% air conditioned, he figures.

"For us cooling is much better than heating in residential work," Kaminsky declares. "Once the cooling system has been installed we don't have trouble with it. With heating, however, if one room isn't quite as warm as the others, we've got trouble. With air conditioning if one rooms slightly warmer than others, the homeowner doesn't seem to mind."

Some Builders Actively Promote Cooling

Some builders of more expensive homes actively promote and try to sell air conditioning, but when the home buyer seems reluctant, City Sheet Metal often tries to sell him directly—with the builder's permission, of course.

"Not all builders want us to approach the buyers directly, but some actually prefer it," Kaminsky explains.

"Also, it's more profitable for us to sell direct to the home buyer, and we collect our money much faster than we do from the builder," he says. "The individual pays us half the cost upon signing of the contract, and the other half when the equipment is delivered."

Despite the fact that a relatively small percentage of its heating installations also have summer cooling, the firm sizes the ductwork in all its jobs for cooling, figuring that sooner or later most of the homeowners will want to add air conditioning, according to Kaminsky.

Incidentally, City Sheet Metal still prefers to install rectangular ducts instead of small, round "high velocity" ducts which have been much used in some areas, even though the rectangular duct systems generally are more expensive.

"There can be a real difference in cost in small houses, but in the larger split level homes the need for extra outlets when small round ducts are used offsets any cost advantage," Kaminsky declares.

"We are thinking of going to round pipe," he admits, "but if we do, we won't use anything smaller than 6-in. ducts. Many contractors from the midwest tell me that they're dropping 4 and 5-in. round ducts in favor

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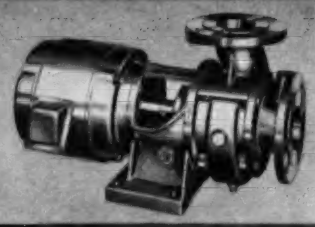

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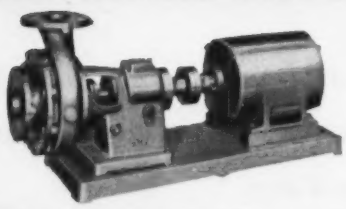

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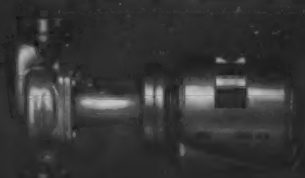

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of the larger sizes," Kaminsky adds.

Fabrication and installation of rectangular ductwork does cost more than using round ducts, but the firm has devised ways to hold these costs to a minimum, Kaminsky discloses.

"We have standardized on various sizes of ducts, and we order our sheet steel accordingly," he explains.

By starting with sheets of the exact, though possibly odd, width, ducts can be formed without waste, he points out.

"This means, of course, we have to order our steel in greater quantity and place our orders three to four months in advance, but the advantages are worth it," Kaminsky believes.

Sometimes savings can be achieved also by paying close attention to house design and construction, he adds.

"Occasionally we'll suggest to the builder that he run the beams in a different direction than intended by the architect so we can place the ductwork between the beams instead of below them, thus making a better and more presentable installation as well as saving on cost," Kaminsky explains. "Thus, it's very important for us to know house construction."

The firm has four draftsmen, working under the direction of Kaminsky.

Careful attention to design and engineering is important in all jobs, of course, but this is especially so in the split-level house so popular in the area.

"We're compelled by FHA to zone split levels here, so we usually us Honeywell zone damper controls," Kaminsky says. "We put in over 400 last year. We treat the street level area, which is usually the recreation room, as one zone and put the rest of the house into the other zone.

"On the top level when we're going to air condition a split level house, we make sure either the supply outlets or the return intake grilles go in at high wall locations to handle the summer load."

The zoning arrangement works equally well on heating and cooling, according to Kaminsky.

"Many contractors seem afraid of these zoning dampers, but they shouldn't be," he says, although he admits it took City Sheet Metal a few installations to find out exactly how they should be installed.

It's important that the damper rod shouldn't be too tightly fitted into the duct, he emphasizes.

"Originally, we started drilling a hole the same diameter as the rod, which doesn't work. Then for a while we had trouble with the dampers sticking in the closed position. Now we allow ¼-in. clearance all around the damper, which prevents it from sticking while not allowing too much 'over-ride' of air when the damper's closed.

"At first, too, we also had some trouble with wiring the controls, but we quickly learned how to do it and now we furnish wiring diagrams to the builder's electrician and give him any other assistance he needs," Kaminsky explains.

First OEM Shipment Of 'Ucon' Refrigerant Set for Redmanson

YORK, Pa.—The first shipment of "Ucon" brand refrigerant to an original equipment manufacturer was made here to the Metal Products Div. of Redmanson Corp., maker of specialized air conditioning equipment, according to an announcement.

Delivery of a one-ton cylinder of Ucon Refrigerant-12 to the new Redmanson plant was made from Institute, W. Va., where a new 50-million-pounds-per-year fluorocarbon plant was put into operation by Union Carbide Chemicals Co., Div. of Union Carbide Corp.

Ucon refrigerant is being sold to OEM by a staff of Carbide refrigerant specialists, headed by Thomas M. Hartley, sales manager-Ucon refrigerants. The company is also marketing Ucon refrigerants through refrigeration parts wholesalers.

Carbide's new refrigerant will be used by Redmanson in specially engineered air conditioning units that are being readied for production under a U. S. Army Corps of Engineers contract. The units, designed basically for cooling electronic equipment, will be mounted in military radar vans.

The Redmanson organization purchased its York plant last August, at which time the firm was incorporated. Since then, it has completely renovated the 40,000-sq. ft. facility in setting up its present mass production shop. In addition, it has also built environmental and performance test chambers.

Former chief engineer at Recony Corp., President Donald D. Stover hand picked other technical specialists, who with him compose a management team that directs the Redmanson operations.

Heading engineering is Vice President Wendell C. Miller who came from Curtiss Wright Corp. where he was staff assistant to the director of development.

In charge of purchasing is C. Alan Peck, Jr., former vice president of Toland & Son, Inc. Sales operations are directed by Vice President L. Earl Hoffman, who was a market development and sales engineering specialist with Phillips Chemical Co.

Managing financial operations is Treasurer Clarke S. Reid, who was formerly with Standard Brands, Inc.

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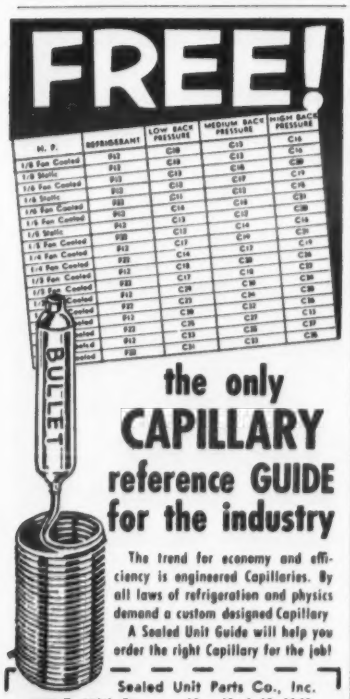

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Refrigeration Problems
And Their Solution
(As Written by Paul Reed)

Thermometer In Service Work (2)

One of the most useful things that two thermometers will do is to check the superheat at which a thermostatic expansion valve is operating, and which also shows how much of the evaporator is really active. This column has repeatedly urged that more attention be paid to the activity of the evaporator than is often done.

The only part of an evaporator that is very effective is the "active" part; that is, the part in which refrigerant is boiling, or changing from a liquid into a saturated vapor. The active part is the part that is really doing the refrigeration job.

Beyond the active part, the vapor is merely warming up or superheating, and in so doing is giving a very small amount of refrigeration. The part that is devoted to superheating reduces the part that is active, consequently reducing the available capacity of the evaporator and of the entire system.

Why then do we not operate the evaporator fully active, with no part of it devoted to superheating? Theoretically we would like to do just that, were it not for some practical considerations.

MUST SUPERHEAT SOMEWHERE

If we did not use the tail end of the evaporator for superheating the saturated gas, then this superheating would have to be done in the suction line or in a heat exchanger. If the active part of the evaporator were 25° F., and the 25° saturated gas went directly into the suction line, the suction line would be cold and would "sweat" and drip water, which would be very objectionable on most installations.

We could use a heat exchanger big enough to warm the 25° saturated vapor up to 50° or 60° (above the dewpoint temperature of the air around the suction line), so the suction line would not sweat. This could be good practice in some instances, and is sometimes done. The use of a heat exchanger has the additional advantage of cooling the liquid refrigerant in the liquid line before it goes to the capillary tube or expansion valve.

So we can either provide a little more tubing or surface in the evaporator than is needed for the active part of the evaporator, and use that additional tubing to superheat the saturated vapor; or we can depend upon a heat exchanger entirely. Either way costs money, so we choose the way that is cheapest, or more effective on that particular installation or application.

Or, we may use a little more evaporator, say enough to superheat the saturated gas about 10°, and also use a heat exchanger to superheat it on up to 50° or 60° or whatever is desirable on the job in question.

However, we should superheat the saturated gas at least 15° or 20°, to keep the refrigerant from going to the compressor crankcase near saturation. How much the gas to the compressor should be superheated depends on the evaporator temperature, location of the suction line, etc.

TX VALVE NEEDS PART OF THE EVAPORATOR FOR SUPERHEATING

The method described in the previous paragraph is just about the best way if we are using a thermostatic expansion valve to feed the evaporator. A TX valve is a "constant superheat" valve, by which we mean that if we put it's bulb at the end of the evaporator as shown in Fig. 1, and just ahead of the heat exchanger, the TX valve will feed just enough liquid refrigerant to the evaporator to keep the evaporator all active except the small portion from B1 to C1 that allows the saturated 25° gas to warm or superheat 10°. Thus we say that the valve is operating on a 10° superheat.

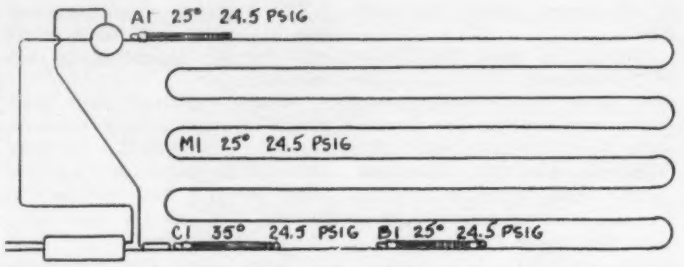

FIG. 1—Thermometers on evaporator with negligible pressure drop, with TX valve operating at 10° superheat.

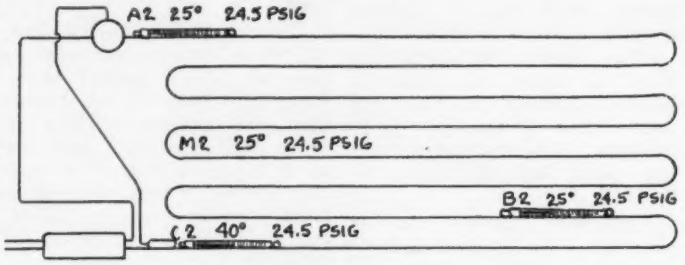

FIG. 2—Thermometers on evaporator with negligible pressure drop, with TX valve operating at 15° superheat.

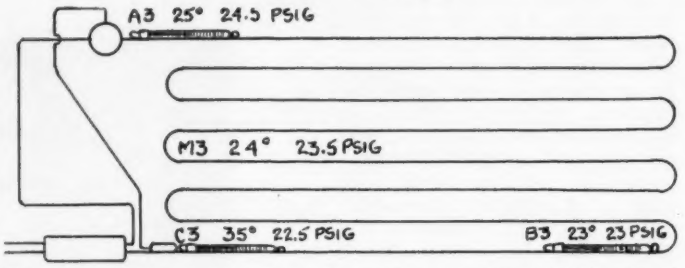

FIG. 3—Thermometers on evaporator with 2 p.s.i. pressure drop, with TX valve set for 10° superheat but, because of the evaporator pressure drop, is operating at a 12° superheat.

TWO THERMOMETERS SHOW TX VALVE SUPERHEAT IN FIGURE 1

Here is where the two thermometers come in handy. If we clip one on at A1 just at the outlet of the TX valve, it should read 25°, and one clipped on at C1 where the TX valve bulb is located, it should read 35°, difference of 10°, provided that the valve is set for and operating on a superheat of 10°.

Suppose that we move the thermometer from A1 on down to a mid point M1 on the evaporator. It should still read 25°. In fact, it should read 25° if placed anywhere on the *active* part of the evaporator, which is the part between A1 and B1. At B1 the thermometer should still read 25°; but if moved toward C1, it starts to rise rather rapidly, for at B1 the evaporator has run out of liquid refrigerant, so from B1 to C1 there is only gas being superheated.

TWO THERMOMETERS SHOW 15° SUPERHEAT IN FIGURE 2

But what if the thermometer at A2 should read 25° and the one at C2 reads 40° as in Fig. 2? Then the difference is 15°, which means that the TX valve is operating on a 15° superheat.

Now it takes more of the tail end of the evaporator to superheat the gas 15° than it did to super-

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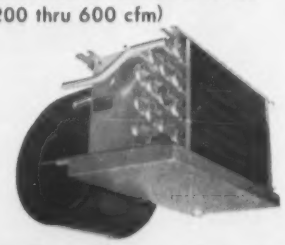

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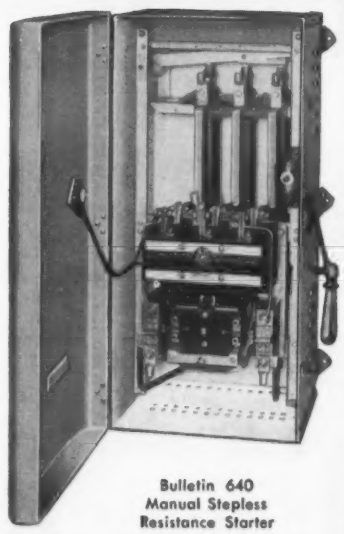

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heat it 10°, so the point at which the evaporator runs out of liquid, has moved back to a point that we will call B2. Thus the active part of the evaporator is now from A2 to B2, which is less than from A1 to B1 in Fig. 1.

As a result, the capacity of the evaporator is less than before, the suction pressure drops and this causes the compressor capacity to be reduced. To do the same refrigeration job, the unit will have to run longer and a larger part of the time, resulting in a higher cost of operation and lower humidity in the space cooled.

If, in Fig. 2, we move the thermometer from A2 down toward C2, it should still read 25° at M2, the midpoint; but as we continue to move the thermometer toward C2, we come to a place, B2, where it starts to read higher than 25°. This is an indication that B2 is the place at which saturation ends and superheating begins.

Thus by using the two thermometers, we can determine the superheat at which the TX valve is operating. In the condition shown in Fig. 2, we would conclude that the superheat was too high, so we would readjust the valve to get the thermometer at C2 to read 35°, that is, we would reduce the superheat setting of the valve. This would move point B2 to where B1 was in Fig. 1, and give a superheat operation of the TX valve of 10° instead of 15°.

TWO THERMOMETERS CAN DETECT EXCESSIVE PRESSURE DROP IN THE EVAPORATOR

In the above, we said that if we move the thermometer from A1 down toward C1, it would read 25° until it came to B1 in Fig. 1 or to B2 in Fig. 2. This was assuming that there was no pressure drop in either evaporator, or at least so little pressure drop that it's effect would not be noticeable.

In actual practice there may be enough pressure drop to cause a noticeable change in the temperature readings as the thermometer moves from A1 to B1 or from A2 to B2; that is through the active part of the evaporator.

Very much pressure drop through an evaporator is undesirable for several reasons. It tends to widen the superheat operation of the TX valve, thus reducing the amount of active surface of the evaporator.

It tends to cause the TX valve to "hunt," and the amount of superheat to vary, causing the suction pressure to fluctuate up and down. The lower suction pressures reduce the capacity of the condensing unit and thereby, of the entire system.

Nevertheless, in actual practice there will always be some pressure drop through the evaporator. In order to get enough refrigerant velocity to facilitate oil return and prevent oil logging, there should be a little pressure drop.

In the case of a 25° evaporator, a *maximum* pressure drop of 1½ to 2 p.s.i. through the evaporator is permissible; up to 3 p.s.i. for 40° evaporators, and down to 1 p.s.i. for 0° evaporators. Moreover, these maximums are enough for normal oil return.

Fig. 3 shows how pressure drop would become evident on our two thermometers. The thermometer at A3 still reads 25°, which for R-12 corresponds to about 24.5 p.s.i. gauge (p.s.i.g.). Therefore, with a 2 lbs. pressure drop through the evaporator, the pressure at the outlet end of the evaporator at point C3, will be 22.5 p.s.i.g.; at M3 it will be 23.5 p.s.i.g., and at B3 we will say that it will be about 23 p.s.i.g.

Since the boiling temperature of R-12 at 23.5 p.s.i.g. is 24°, a thermometer at M3 would read 24° likewise, at B3 where the pressure is 23 p.s.i.g., the thermometer would read 23° corresponding to 23 p.s.i.g. (These temperatures are not exact, but are correct to the nearest degree, which for purposes of illustration are close enough.)

The temperature at C3 would not correspond to 22.5 p.s.i.g., for the refrigerant is not saturated at that point. The power element of the TX valve would still respond to the 24.5 p.s.i.g. at the inlet of the evaporator, so it would maintain a 35° temperature at C3, the same as in Fig. 1.

Therefore, with the bulb of the TX valve at 35° as shown by the thermometer at C3, and point B3 being 23°, the difference of 12° would be the superheat at which the TX valve would operate, instead of at 10° for which the valve is set. Thus more of the evaporator would have to be devoted to superheating, leaving less surface for the useful, active part of the evaporator.

To offset the effect of pressure drop, perhaps the TX valve could be readjusted to maintain a still lower superheat that would enable the valve to actually maintain a 10° superheat instead of a 12° superheat, and thereby use the maximum amount of evaporator surface.

Or if an equalizer connection were used, the TX valve could maintain a 10° superheat on this evaporator even with the 2 p.s.i.g. pressure drop and without changing the superheat setting of the expansion valve; for the power element of the valve would be affected by the lower pressure of about 23 p.s.i.g. near point B3, so the bulb temperature would be held at 33° (23+10) instead of 35°. This would help the TX valve but not entirely restore the loss of capacity of the compressor due to the lower suction pressure.

Our thermmeters would enable us to tell us if we had excessive pressure drop, for moving the thermometer at A3 toward B3 would cause the thermometer to gradually read a lower temperature, which would not be true if there were no pressure drop.

However, beyond B3 the thermometer would begin to rise, and rather rapidly, as it was moved toward C3. In this way our thermometers would enable us to detect excessive pressure drop and to estimate fairly closely how much the pressure drop is.

The readings on the thermometers could not be taken accurately enough on ordinary thermometers to detect small pressure drops, but they would show up pressure drops that would be great enough to adversely affect the operation of the TX valve and the capacity and efficiency of the system as a whole.

It must be again emphasized that the two thermometers must be accurate for best results, and even for useful results they must be matched to one another; that it, if they are slightly inaccurate, they must both be off in the same amount and in the same direction.

(To Be Continued)

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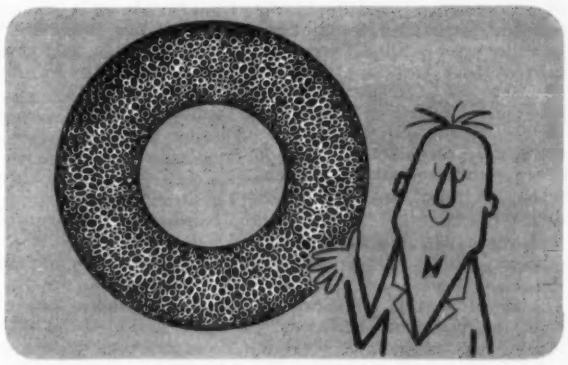

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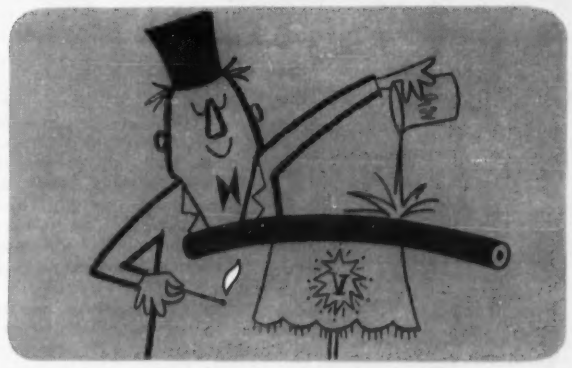

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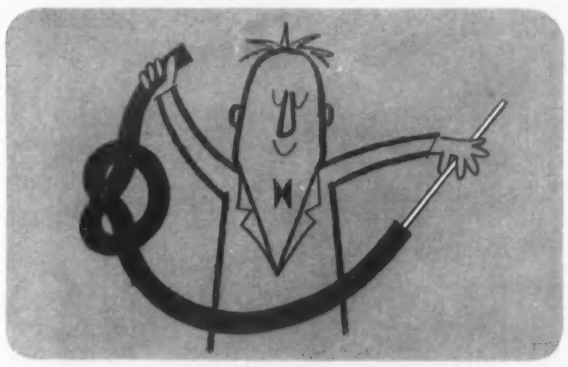

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Developing Military Standardization (4)

'System Approach' Deemed In Full Consonance with Both The Intent of the Law and Scope of the Supply Problem

Editor's Note: This is the fourth instalment of a paper prepared by Sterling Smith of Consultants, Inc. describing the thinking and concepts involved in developing a program of military standardization for refrigeration and air conditioning equipment. Smith is technical director for the standardization project.

The "system" approach is in full consonance with both the intent of the law and the scope of the supply problem. Approximately 40% of the Federal Supply Catalog Classes cover functional equipment which constitutes 80% of the military supply system by numbers of items.

Thus, by standardizing "systems" many standardized components of these systems which are interchangeable between the given systems and which might be common to other classes of equipment, could be "fed back" to the "supply item" classes and used interchangeably in more than one class of equipment as standardization progressed.

For instance, a "system" might consist of, among other components, a valve, bearings, a compressor, a motor, a battery, and a generator. These "items" are assigned to different Federal Catalog Classes. Ten of these "systems" each producing the same "end product" would result in stock numbering 10 of each of these items.

This is possible because of the probability of the individual items, even though they perform the same function, having a different manufacturer's stock number or description due to there being a design or dimension change. When the "System" is analyzed as a whole, it is entirely possible that one battery or motor or valve could serve all 10 of the "systems," thus eliminating the other nine from the Federal Supply Catalog.

The responsibility for the direction of the standardization program was assigned originally to the Defense Supply Management Agency of the Munitions Board which, in turn, designated the military agency with the major interest to be immediately responsible for each type of equipment.

This was later changed under the Department of Defense Reorganization Plan No. 6 of 1953 by which the responsibility for the entire military standardization effort was assigned to the Assistant Secretary of Defense (Supply and Logistics) by DOD Directive 3126.1, dated Aug. 13, 1953. He, in turn, reassigned this responsibility to the agencies of the military departments based on the degree of their interest in groups of items of equipment.

'Standardization Projects' Set Up by Services

The responsible services, i.e., Army, Navy, Air Force, in turn set up "standardization projects" based for the most part on the theory that item specifications could be standardized most quickly and effectively. Certain items were selected for attention, a "task force" of service representatives representing the interested departments of each service was set up under the chairmanship of a representative of the Defense Supply Management Agency, and the work of standardization was started on the item or group of items.

This approach, because of the lack of a definitive program and operational procedure, proved to be difficult to manage and slow in achievement. Therefore, in compliance with an explicit 11-page directive from the Secretary of Defense, dated Oct. 15, 1954, the Assistant Secretary of Defense (Supply and Logistics) took action to reorient the standardization program.

This was done by assigning standardization responsibility to the military departments on the basis of classes of supply as they were developed in the Federal Supply Catalog Program. These commodity Classes, over 500 in number, make up the Federal Supply Classification.

Each department was made responsible for achieving and maintaining standardization of the commodity classes for which it had the basic responsibility. In the achievement of this, the departments were directed to develop "detailed plans" for doing the job, this detailed plan to be a blueprint for a single Department of Defense approach.

Each of these Federal Supply Catalog Classes covered a grouping of presumably related items oftentimes including thousands of separate items in a single group. Together, these classes added up to all of the items bought, stored, and distributed in the military supply system. Classes were divided among the military departments according to their theoretical major supply interest, their special mission and/or their technical ability.

This presumably homogeneous grouping of the Federal Supply Catalog Classes was intended to provide a means of control for most management functions including standardization. However, it is now apparent that the Federal Supply Catalog Classes should **guide only and not rigidly control** the standardization program.

This approach, based on "catalog item" standardization rather than "system" standardization, has proved to be extremely unwieldy except for isolated projects, inasmuch as it is primarily a literary exercise rather than technical study related to functional and operational characteristics.

There is a fundamental difference between the approach to the standardization of simple, relatively homogenetic supply items and technically complex units or systems composed of many interchangeable components having multi-purpose capabilities.

As an example, there is little involved in the standardization of waste paper baskets, railroad tracks, or ball peen hammers. On the other hand, the standardization of such complex items as materials-handling equipment, engine generator sets, or water distillation units, demands the extensive coordination by a trained project director of qualified engineering capabilities, industrial resources, and long-range planning.

Five years of practical experience in the actual standardization of relatively complex items of equipment as represented by refrigeration and air conditioning systems has clearly demonstrated the practical contribution which the system approach can make to the simplification of supply management control.

It was found that, as the standardization of system components progressed, many of these standardized components could be "fed back" into several Federal Supply Catalog Classes in addition to the class under immediate consideration. Thus, it is possible that by the proper coordination of effort, application of a standardized component may be made in a wider range of uses than those originally contemplated.

At the same time as standardized components are developed and "fed back" into the supply system, the number of previously cataloged, but nonstandard, items may be substantially reduced as they will be replaced by fewer, but standardized, components. The nonstandard items are then withdrawn from the supply system.

The refrigeration compressor is an example of the interchangeable component of a system which has multi-purpose capabilities.

As earlier noted, before the standard was written on "open-type" refrigeration compressors, the Department of Defense was buying 39 makes and models for use in Military Field Refrigeration and Air Conditioning Equipment up to 10 hp., a small area of the total Department of Defense requirement for such equipment. The standard calls for two models which may be procured competitively. These standard compressors may be used in at least two other Federal Supply Catalog Classes.

To call the preceding pages history is almost a euphemism, for our purpose is analytical rather than to tell a story. To attempt to describe the thousands of man-days and hundreds of millions of dollars which have been used in the cataloging, the development of catalog classes, and standardization itself, in so brief a space, is impossible.

Again we stress that our discussion does not in any way purport to suggest a panacea.

(To Be Continued)

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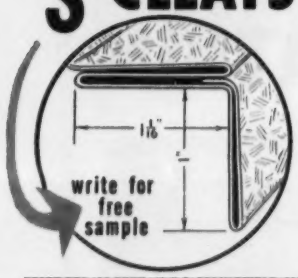

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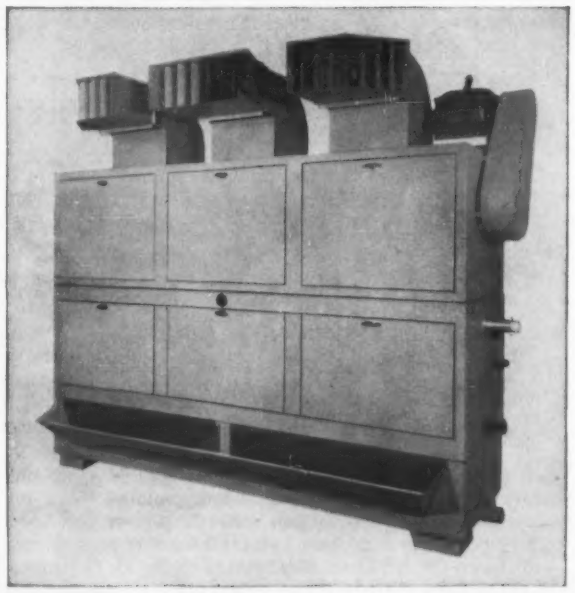

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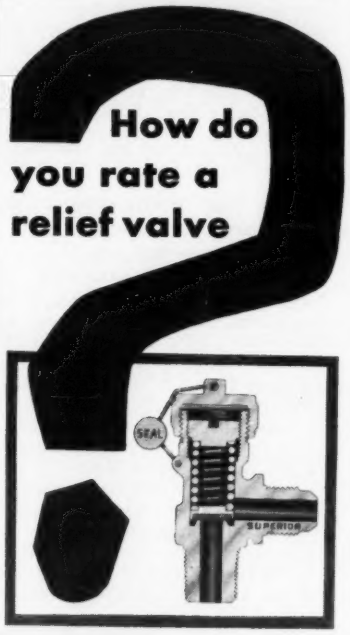

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Air Distribution Requirements In Year-Round Air Conditioning

By Frank D. Klein, Chief Engineer, Governair Corp.

With the previous text on factors affecting coil velocity understood, the following is a typical method for selection, or evaluation in investigation, of a direct expansion coil.

Consider first that there are two parts of the coil: (1) the Coil itself and (2) the refrigerant Thermal Expansion Valve, (Capillary not considered here.)

Consider next that the coil is made up of copper tubing (typically here considered as ⅝-in. o.d., .028 wall thickness) and aluminum fin plates 0.011 in. in gauge thickness.

Finally, consider that the thermal expansion valve is for R-22, and is multiport or multi-outlet type with remote bulb, thus providing for multi-feed to each pre-selected circuit.

The object of the coordinated work between the expansion valve and the coil is to bring about heat transfer between the air being passed over or through the coil and the surfaces of the coil.

In order to do this the refrigerant must be introduced to the coil at a rate in direct ratio to the heat in the air being passed over or through the coil in order to bring about complete transition of the refrigerant from liquid to gas by the time refrigerant reaches the exit end of the coil or suction line.

EXPANSION VALVE OPERATION

The expansion valve accomplishes this through adjustment for the degree of superheat found necessary, thus metering the amount of refrigerant to the various coil circuits required. The thermal bulb of the expansion valve, being attached to the leaving suction line adjacent to the exit of the coil, feels the rise in temperature above the saturated condition of the refrigerant at entry and at the boiling point on leaving and through the mechanism of the valve design meters the refrigerant into the coil at the rate required.

For a given set of conditions, adjusting this expansion valve to points in excess to the comparable rate of change by heat will cause liquid to be fed in excess to the heat present to boil it off and will result in liquid passing on through the coil adjustments less than the necessary amount of refrigerant required for the amount of heat to be transferred will result in starving the coil.

The coil surface on the other hand acts and operates as an impingement surface for the air; its surface temperature is less than that of the air itself and through the heat transfer process changes the air temperature on the leaving side of the coil. At this point, a review of basic psychrometry is needed for specific understanding of the process.

REVIEW OF PSYCHROMETRY

By referring to the previous text on Psychrometry, we have learned of the "condition" of air under various circumstances. The text has defined:

1. The *Gas* (Air) *Constant* for Dry Air as 53.3 ft. lb./degree R. (R_a).
2. The *Specific Volume* of Dry Air is equivalent to: (1) the Gas Constant for Dry Air at Absolute Temperature in degree R by (2) the pressure of Dry Air in pounds per square feet absolute.

It is expressed as the value "v_a" in R_aT/P_a.

3. The *Specific Heat* of Dry Air, known as the value "c_{pa}" for all practical purposes is taken at 0.24 B.t.u./lb./°F.
4. The *Enthalpy* of Dry Air or the value know as "h_a" may be reduced to Specific Enthalpy at atmospheric pressure (29.92 H_g) by

$h_a = 0.24\ (t\text{-}0) = 0.24t$

here, h_a is Enthalpy of Dry Air in B.t.u./lb. and t is the Dry Bulb Temperature in degress F., 0° being the reference point at 29.92 H_g barometric pressure.

However, in the context of this point of the text, wherein we are evaluating and selecting the evaporator, we are not dealing with Dry Air, but with air-vapor mixtures, so the same properties for air vapor mixtures must be understood more specifically. Thus:

1. The *Gas Constant for Water Vapor,* using the molecular weight of water as 18.0 is generally accepted as the value "R_w" which is 85.7 ft. lb./lb./degree R.
2. The *Specific Volume for Water Vapor,* or the value "v_g," results from the Gas Constant for water vapor, temperature in absolute as "R" by the vapor pressure of the water vapor under the Dry Bulb temperature indicated. Such as:

$v_g = R_wT/P_g$

3. The *Specific Heat* for Water Vapor, or the value c_{pg} can usually be found in the many tables available. For all practical purposes the value 0.45 can be used for either or both superheated vapor and saturated vapor.
4. The *Enthalpy* for Water Vapor, for all practical purposes can stem from information available in the general Steam Tables; expressed here it is the value "h_g." The relationship may be established much like the following:

$h_g = 1061 + 0.45t$

which example is used, taking the 1061 factor as a general margin for error at 70° F., for by referring to the Tables (see REFERENCE TABLES INDEX — or consult "THERMODYNAMIC PROPERTIES OF STEAM" J. H. Keenan and F. G. Keyes, John Wiley & Sons, Pub.) though the actual value is 1092.3 B.t.u./lb. the margin for error as calculations are made vary only between 0.03 and 0.19%.

(To Be Continued)

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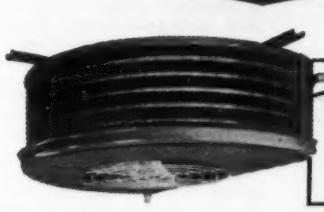

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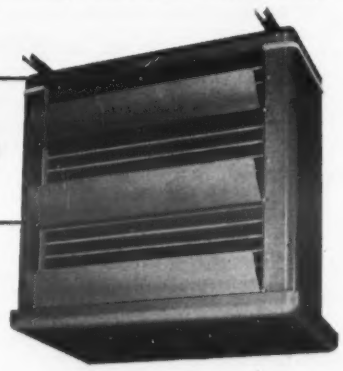

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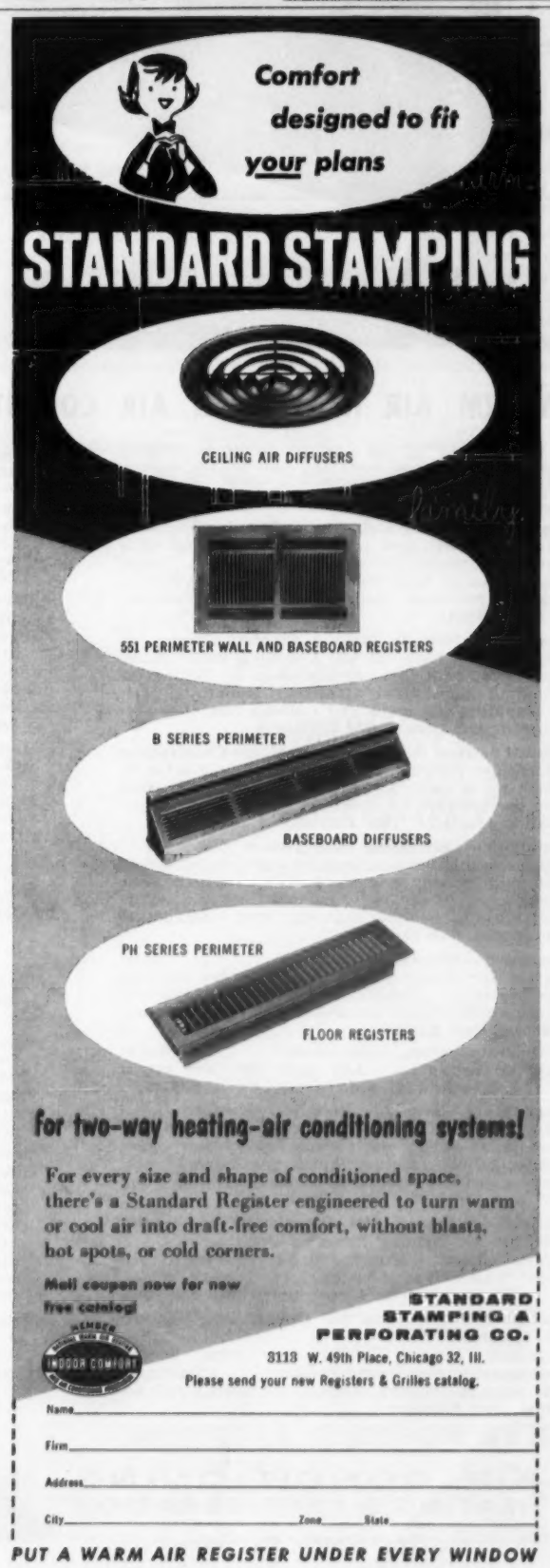
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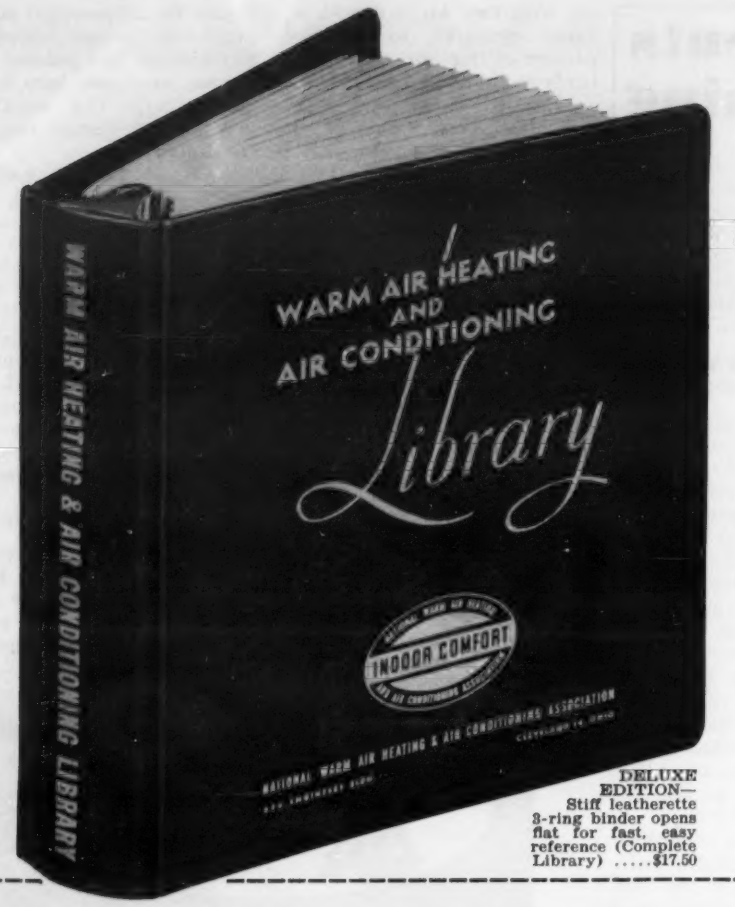
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Greater comfort performance with winter, summer or year 'round systems. . . . Adjustment of room thermostat, controls, and system balancing. **(3rd Edition)**

Manual 7 — Design and Installation of Warm Air Winter Air Conditioning Systems..... .75
Designing forced warm air systems for houses up to 120,000 B.t.u.h. heat loss. . . . Selecting furnace, blower, duct, and register size. . . . Locating registers and return intakes. . . . System layouts. . . . Installation and operation. **(4th Edition)**

Manual 7A — Design and Installation of Warm Air Ceiling Panel Systems..... .75
For residential and small non-residential structures with heat losses not exceeding 120,000 B.t.u.h. . . . Furnace and blower size. . . . Lay out of panel inlets and outlets. . . . Supply and return systems. . . . Panel construction. **(3rd Edition)**

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Manual 9 Supplement ..... .50
Perimeter warm air heating and ventilating systems for buildings constructed on concrete slab floors. . . . Can be used to encourage architects, heating engineers, and school boards to use perimeter systems. **(1st Edition)**

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Design and installation of systems using 4-inch round pipes for warm air runs. Systems described are "low velocity". . . . May be used with furnaces rated at total static pressure of .20" water gauge or comparable rating at sea level with temperature rise range of 70° - 100° F. through furnace. **(4th Edition)**

Manual 11 — Summer Air Conditioning..... 1.25
A tentative manual for design and installation of summer air conditioning systems for new and existing residences. . . . Heat gain calculation. . . . Design procedure. . . . Sizing of distribution systems. **(4th Edition)**

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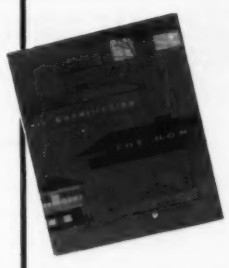

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AIR CONDITIONING HEATING & REFRIGERATION NEWS
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OHI Convention Program--

(Concluded from Page 1, Col. 4)

Details of the convention program are as follows:

TUESDAY, APRIL 28

10 a.m.-12 noon—Distribution Division board of directors and annual meetings.

10 a.m.-12 noon—Manufacturer and Accessory Division annual meeting.

10 a.m.-12 noon.—Technical Division annual meeting.

2 p.m.-2:30 p.m.—Retiring OHI board meeting.

2:30 p.m.-4 p.m.—Oil Heat Institute of American annual meeting.

4 p.m.-5 p.m.—New OHI board of directors meeting (closed).

6 p.m.-8 p.m.—OHI executive committee dinner meeting.

WEDNESDAY, APRIL 29

9:30 a.m.-12 noon—New OHI board of directors meeting (closed).

10 a.m.-4 p.m.—West coast regional advisory committee meeting.

7 p.m.-10 p.m.—"Old Timers Dinner," Charles Bendtz, master of ceremonies.

THURSDAY, APRIL 30

9 a.m.-11:45 a.m.—Technical Division symposium, moderator: M. J. Reed, Socony-Mobil Oil Co.

"Cloud 9 Panel on Oil Burning Developments for the Future."

"Fuel Oil Additives and What They Are Doing for the Industry."

"Research Results on Oil-Fired Water Heaters."

"Applications of Fuel Nozzles In the Field."

10 a.m.-11:30 a.m.—Annual meeting Oil Heat Institute of Washington.

12 noon-6 p.m.—Pacific Coast OHI golf tournament, Inglewood Country Club.

6 p.m.-11 p.m. — Cocktails, dinner, dancing, Inglewood Country Club.

FRIDAY, MAY 1

9 a.m.-11:45 a.m.—Distribution Division Dealer Management Clinic, moderator: T. R. Loizeaux, Sr., national chairman, Distribution Division; president, T. R. Loizeaux Fuel Co., Plainfield, N. J.

"Why and How We Added a Service Department to Our Heating Oil Business," W. Allman, vice president, Dalton Oil Co., Inc., Gary, Ind.

"The Heating Oil Distributors Position—Past and Future," J. Loeffler, president, Commerce Petroleum Co., Chicago.

"Increasing Your Heating Oil Sales by Direct Mail," Everett Elliott, treasurer, C. L. Elliott Co., Danvers, Mass.

"Stepping Up Delivery Output Per Hour," T. R. Loizeaux, Sr., president, T. R. Loizeaux Fuel Co., Plainfield, N. J.

"Industry Cooperation In Developing Realistic Codes," Ed. Hees, executive vice president, New York Oil Heating Association, Inc.

"How We Sell Our Customers and Keep Them Sold," Fred Griffin, president, Griffin Fuel Co., Seattle.

"How Important Is Your Credit Department In Profit and Sales?" W. E. Simon, president, Simon Oil Co., Lewiston, Idaho.

"Why We Lose Sales to Electric Heat," Henry Auld, Jr., president, Automatic Heat Co., Eugene, Ore.

"Breaking The Sound Barrier In Dealer-Supplier Relations," C. B. Grenier, president, Grenier Oil Co., Inc., Bellingham, Wash.

10 a.m.-12 noon—Manufacturer and Accessory Commercial Industrial Sections meeting.

12 noon — Ladies' luncheon, Kiana Lodge, Bainbridge Island.

1:30 p.m.-4:30 p.m.—Ladies' cruise, Seattle harbor and vicinity.

12:15 p.m.-1:10 p.m. — OHI preluncheon cocktail party (by invitation only).

1:15 p.m.-3:15 p.m. — OHI grand luncheon, Toastmaster: Al Loucks, president, Home Fuel Oil Co., Salem, Ore.; Speaker: B. W. Pickard, vice president of marketing operations, Standard Oil Co. of California.

3:30 p.m.-6 p.m.—Commercial-Industrial symposium (invitation only); moderator: Larry Sibley, vice president, Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.

"Pacific Coast Oils."

"Commercial-Industrial Equipment Necessary for Burning Pacific Coast Oils."

"Preparation of Military Specifications."

SATURDAY, MAY 2

9 a.m.-12 noon—Distribution Division dealer management clinic, moderator: Al Flournoy, secretary - treasurer, Seattle Diesel Oil Co., Seattle.

"Using Accounting and Tax Tools Profitably," Norman Starr, partner, H. L. Shrager & Co., Plainfield, N. J.

"Increasing the Number of Your Budget Plan Accounts," R. K. Swett, president, Swett Bros., Inc., Springfield, Mass.

"Company Methods of Combating Natural Gas Competition," Ray Nathan, president, Nathan Oil Co., Freeport, N. Y.

"Selling Oil Heating Equipment to Builders," L. Braun, president and general manager, Piping Rock Fuel Corp., Halesite, L. I., N. Y.

"The Gasoline Jobber Develops a Fuel Oil Business," Lavern Schaetzel, president, Schaetzel Oil Co., Germantown, Wis.

"How We Sell Our Customers and Keep Them Sold," M. N. Vining, general manager, Diesel Oil Sales, Seattle.

"Influencing the Special Interest Groups—Builders, Architects, Real Estate People," R. G. Lindsay, president, Economy Oil Co., Portland, Ore.

"How Association Purposes and Practices Affect Your Business," Al Flournoy, secretary-treasurer, Seattle Diesel Oil Co., Seattle.

"The Industry Needs Cooperative Advertising Programs," D. Robert Hayward, vice president, Griffin Fuel Co., Tacoma, Wash.

6:30 p.m.-7:30 p.m.—Cocktail party.

7:30 p.m.-8:30 p.m.—OHI of Washington annual banquet.

9 p.m.-10:30 p.m.—Entertainment.

OHI Speaker--

(Concluded from Page 1, Col. 5)

"It is important," he emphasized, "that everyone in the oil heating industry connected with services to the public be fully trained and developed so that the industry's best foot will always be forward in areas reaching the customer and the public."

Burkhardt said that another way this end can be served is for dealers to realize that they have a responsibility to the public which extends beyond the sale and delivery of heating oils. This public responsibility entails the servicing, the sale, and the installation of equipment, he noted.

Buffalo Code--

(Concluded from Page 1, Col. 3)

the Fire Prevention Bureau will serve on a five-member Board of Heating Examiners authorized by the code. The board will administer the code and examine applicants for heating contractors' licenses.

Members of the board are appointed by the mayor, who designates the chairman. The other three members must be Buffalo residents. Two must be heating contractors.

Sacramento Group To Help Frame Code

SACRAMENTO, Calif. — Assisting in formulation of a modern heating and air conditioning code for the city of Sacramento is a major objective of Sheet Metal, Heating & Air Conditioning Contractors Association, Sacramento District, reports Gale E. Dunn, executive manager.

The code in the city has been placed on the 1959 agenda. In 1958 the association successfully completed its efforts in behalf of a modern heating code for Sacramento County which has a steady population and building growth outside the city limits.

The county inspection is handled by two heating inspectors, with required sheet metal and air conditioning experience.

Dunn reports that the year 1958 saw a 40% increase in activity of the association's bid depository which serves the counties of Sacramento, Yolo, Amador, Placer, and El Dorado, and was established in 1937. The depository is coordinated with the Associated Plumbing Contractors depository for bids on the same items of a contract.

Archie Lawson was president of the association for 1958. He is succeeded by Claude G. Bobo of Bobo's Sheet Metal.

Other officers for 1959 are: Vice president, Harlan Silver of Fraser Air Conditioning; secretary, Frank Hamilton of Hamilton Sheet Metal; and treasurer, Bruce Nickel of Central Heating & Sheet Metal.

Room Cooler Sales Up--

(Concluded from Page 1, Col. 2)

fiers by certain distributors to their dealers in its territory rose to 80 from 46 in January, 1958. However, air conditioner sales were down about 36%, dropping from 698 in January of last year to 449.

The situation was just the opposite in Cleveland, a report by the local Electrical League indicates. According to this report, compiled from distributor sales figures, 236 room coolers were sold in January, up 110% from the year-earlier total of 112.

Room air conditioner sales also were up in the Philadelphia area and in the West Penn Power Co.'s southwestern Pennsylvania territory.

In the Philadelphia area including Bucks, Chester, Delaware, Montgomery, and Philadelphia counties, distributor sales of room units rose to 4,214 from 3,565 the previous January.

Room cooler sales in January in the West Penn territory totaled 27 compared with 26 a year ago. Dehumidifier sales increased to 17 from 8 in 1958.

A report compiled by the Electric Power Board of Chattanooga indicates that dealer sales of air conditioning units for residential use aggregated 23 (including four central units) in January of this year, down from the 42 reported for the same year-ago month.

Domestic heat pump sales in that area were down from 12 a year earlier to 2 in January, 1959. However, sales of air conditioning units and cooling devices for commercial use rose to 22 from 12 a year ago.

A report received recently from Kansas Gas & Electric Co., Wichita, showed that retailer sales of room air conditioners in 1958 in that area totaled 6,419, a decline of about 10% from the 1957 level of 7,163. Sales last year of central air conditioners also were off from the previous year, dropping about 25% to 584 from 777 a year earlier.

Data compiled by Pacific Gas & Electric Co. from reports by dealers in 47 counties in northern and central California showed that room air conditioner sales in 1958 came very close to equalling the 1957 volume. According to the utility, a total of 10,333 room units were sold compared with 10,469 in '57.

Sheet Metal Distributors Plan 49th Spring Meeting

PITTSBURGH — Management forums on sales, marketing, and general administration will be features of the 49th spring meeting of the National Association of Sheet Metal Distributors to be held at the Pick-Roosevelt hotel here April 30 and May 1, says Thomas A. Fernley, Jr., executive secretary.

Edmonton Firm Uses Refrigeration Plant To Build Ice Bridge

EDMONTON, Alba., Can. — Lorne Clapson, general manager of Twin Bridges Sand & Gravel Ltd., said a $50,000 artificial ice highway across the North Saskatchewan River here was completed.

The gravel company used a 75-hp. refrigeration plant, the same type that makes ice in curling and hockey rinks, to form an ice bridge across the river just east of Edmonton.

The company has a $293,000 contract to haul 200,000 tons of gravel into the city and decided to build the span. It felt the bridge would bear until late March the 25-ton payloads its trucks would carry.

Officials expected the bridge would save 600,000 ton-miles and plenty of time. It costs from six to 10 cents to truck one ton of gravel one mile. They said the trucks would save 3½ miles a haul by using the route, which leads directly into the city on lightly-used roads.

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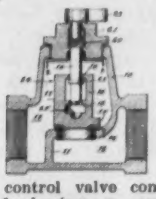
PATENTS

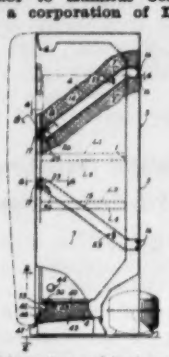
Week of Nov. 18 (Concluded)

2,860,659. FLOW CONTROL VALVE. Gilbert F. Carlson, Skokie, and Harold A. Lockhart, Wauconda, Ill., assignors to Bell & Gossett Co., Morton Grove, Ill.



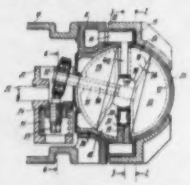
A flow control valve comprising a hollow body having an apertured interior wall including a valve seat and defining with the body inlet and outlet chambers, a vertical stem mounted within the body coaxial with the seat. . . .

2,860,807. REFRIGERATOR CABINET. Evans T. Morton, Galesburg, Ill., assignor to Admiral Corp., Chicago, Ill., a corporation of Delaware.



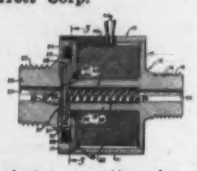
7. A refrigerator cabinet comprising an outer shell which has spaced sides, a bottom wall and a front opening above the bottom wall and between the sides, an inner liner within said shell and having spaced sides and a bottom wall in spaced relation to the sides and bottom wall of the shell, said liner having a front opening above its bottom wall and between its sides. . . .

2,860,828. COMPRESSOR. Jorgen W. Jonassen, Rutherford, N. J. Application July 29, 1954, Serial No. 446,467.



1. A conic crank compressor comprising a housing having a substantially spherical interior, a diametrical disc member separating said spherical interior into two pumping chambers each less than hemispherical, inlet and discharge ports and passages in said diametrical disc member and opening into and from said pumping chambers. . . .

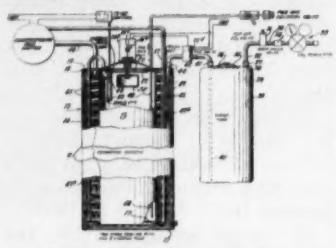
2,860,850. SOLENOID VALVE. William A. Rhodes, Phoenix, and Harry E. Etches, Mesa, Ariz., assignors to The Garrett Corp.



1. An electromagnetic valve comprising: a casing; core means disposed axially within said casing and having a free end; an electromagnetic winding disposed about said core means; end closure members associated with said core means and forming a part of said casing, an electromagnetic gap being formed intermediate said free end of said core means and one of said closure members. . . .

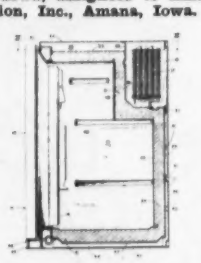
Week of Nov. 25

2,861,433. PRE-MIX BEVERAGE VENDING MACHINE. Jack J. Booth, Dallas, Texas.



1. In a heat exchanger for precarbonated beverage vending machines, a tank having closed top and bottom, a beverage coil of tubing disposed in said tank having its inlet and outlet ends extending from the top of said tank, means for introducing beverage into said inlet end under CO_2 pressure, valve means for discharging said beverage at said outlet end, a refrigerant coil in said tank in concentric parallelism with said beverage coil. . . .

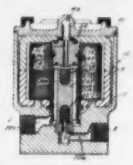
2,861,434. REFRIGERATING APPARATUS. Robert E. Moore, Whittier, Calif., and Wayne A. Giddings, Cedar Rapids, and Walter C. Barnard, Belle Plaine, Iowa, assignors to Amana Refrigeration, Inc., Amana, Iowa.



Editor's Note: Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

1. In a built-in refrigeration unit, a cabinet comprising an inner open front insulated refrigerated compartment and an outer shell extending about said compartment defining therewith a top air inlet chamber extending the full width and the major portion of the depth of said compartment, a rear upper machine compartment extending substantially the full width of said refrigerated compartment and of materially less extent than the latter from front to back. . . .

2,861,594. SOLENOID VALVE. John E. Collins, Akron, Ohio.



1. A fluid control valve comprising a valve housing having a flow passage therethrough, a sleeve fixed in said housing and having a first end thereof communicating with said flow passage and a second end directed away from said flow passage, an electro-magnetic coil encircling said sleeve in said housing, a member having a portion fitting within said second end of said sleeve for restricted telescopic sliding sealing engagement with said second end of the sleeve to form a yieldable stop in said sleeve. . . .

2,861,596. HEAT EXCHANGER BAFFLE SYSTEM. Harold N. Ispen, Rockford, Ill.

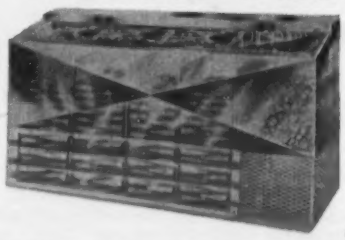
1. In a heat exchanger, the combination of, a heat exchanger tube, a plurality of strips each twisted longitudinally to define between its opposite end portions helical passages on opposite sides of said strip, each of said strips being of substantially uniform width throughout the length thereof corresponding substantially to the internal diameter of said tube. . . .

2,861,597. AIR GUIDE DEVICE. Martin M. Gracer, Levittown, N. Y.

4. An air guide device comprising a plurality of curved guide blade members arranged in mutually spaced relationship to each other, said guide blade members being rectangular in shape, with smooth, straight top and bottom edges, a top rail having a plurality of downwardly extending projections formed therein. . . .

(To Be Continued)

"A CASE OF COOL JUDGMENT"



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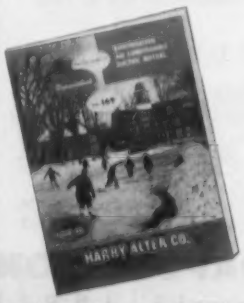

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POSITIONS WANTED

NEED REPRESENTATION? Established manufacturer's representative Texas - Oklahoma and New Mexico. If we can't sell it . . . Don't make it! BOX A6213, Air Conditioning, Heating & Refrigeration News.

OVERSEAS SALES engineer — Fluent Spanish and some Japanese, 27, single, recent university graduate—B.S.M.E. with major in air conditioning and refrigeration, seeks training position with eventual overseas assignment. BOX A6214, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEER desires connection with O.E.M.—prime or component manufacturer, Midwest area preferred —would consider other with right opportunity. 20 years, sales, application and service background commercial and air conditioning. BOX A6215, Air Conditioning, Heating & Refrigeration News.

POSITIONS AVAILABLE

ENGINEER REFRIGERATION Controls—To head a department on design and development of commercial refrigeration control valves of all types; national corporation with midwestern manufacturing and engineering facility; salary and bonus commensurate with work background and ability. Send full details, qualifications and personal data, to BOX A6172, Air Conditioning, Heating & Refrigeration News.

MANUFACTURER'S AGENTS for a complete line of air and water-cooled central air conditioning equipment, both commercial and residential. Desire agents already established in heating and air conditioning, calling on wholesalers and OEM accounts. Give details in first letter stating area covered and other lines handled. BOX A6177, Air Conditioning, Heating & Refrigeration News.

DEVELOPMENT ENGINEER. Attractive position open for experienced engineer of residential split systems, package units and/or heat pumps. Also interested in engineer experienced in design of commercial air cooled air conditioning equipment. All replies given prompt, confidential attention. Salary open; location, Michigan. Reply BOX A6201, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEER—college degree in air conditioning and refrigeration, between 30 and 40 years of age, who has had experience calling on contractors and engineers. Growing midwest manufacturer of compressors, condensing units, full line of chillers 10 to 300 tons, and cooling towers. Duties require working with manufacturers' agents who sell direct to all contractors, requiring substantial travel. Give full details of education, experience, jobs held with salaries-references, minimum salary required in letter of application to BOX A6203, Air Conditioning, Heating & Refrigeration News.

APPLICATION AND sales engineer, technical graduate or equivalent wanted with refrigeration experience and sales. Age 25-32. Interesting work calling on contractors, wholesalers and air conditioning and refrigeration manufacturers in established territories for nationally known control manufacturer. Starting salary based on experience plus commission after indoctrination. All replies will be kept confidential. Address reply to BOX A6207, Air Conditioning, Heating & Refrigeration News.

REFRIGERATION AND air conditioning serviceman wanted. Heating background also desirable. Must be completely qualified. We offer year round work, regular wage increases and paid vacations. Located in Ohio. In letter include resume of full experience, a picture of yourself if possible, and references. BOX A6208, Air Conditioning, Heating & Refrigeration News.

WANTED, SALES representatives. Calling on users of copper refrigeration tubing. Excellent opportunity offered by leading importer. Tubing made in strict accordance with ASTM specifications. In reply state age, experience, lines now carried, to BOX A6216, Air Conditioning, Heating & Refrigeration News.

AIR CONDITIONING product engineer —Leading manufacturer of air conditioning and refrigeration equipment has opening for project design engineer in newly established engineering section on heat pump and residential package air conditioners. Desire graduate engineer with at least 2 years' design experience on residential air conditioners and refrigeration products. All replies held in strict confidence. Send short resume to BOX A6217, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEERS — manufacturer's representative covering N. Y. trade area OEM, wholesale, and major contractors in refrigeration and air conditioning industry has opening in N. Y. metropolitan area. Schedule of remuneration attractive only to financially secure or semi-retired successful persons who get satisfaction from challenging sales tasks. BOX A6218, Air Conditioning, Heating & Refrigeration News.

SALES ENGINEER, graduate preferred, selling to original equipment manufacturers refrigeration components and accessories. Must have experience in design engineering, refrigerating systems. Must possess sales ability. Relocation not necessary. Please include resume with reply. BOX A6219, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT WANTED

WANTED SURPLUS condensing units with or without motors. Preference given Frigidaire compressors. SOUTH TOWN REFRIGERATION CORP., 8041 South Western Avenue, Chicago 20, Illinois or Phone Prospect 8-1000.

NEW OR used and repairable compressors, condensing units, valve plates, and parts for General Electric, Brunner, Carrier, Worthington, Copelametic, etc. Give Model No., Horsepower and full description. UNITED REFRIGERATION CORPORATION, 514 W. 12th St., Los Angeles 15, Calif.

EQUIPMENT FOR SALE

3 PHASE, 1½ & 2 hp. motors, used Delco and Century, all guaranteed. Recently removed from multiple refrigeration systems. $15. ea. Also 100 guaranteed electric refrigerators. Domestic from $25. Write for brochure. PEERLESS SALES CO., 2237 Georgia Ave., Wash., D. C.

RECONDITIONED (like new) everything in commercial refrigerated cases. Approx. 50% of original factory cost. All equipment and units guaranteed, crated and shipped anywhere. Write: B.T.U. DIST., 41 Greenwich St., Hempstead, L. I., N. Y.

FULLY RECONDITIONED compressors and condensing units for refrigeration and air conditioning. All makes 1 to 75 hp. Also coils and condensers. Exceptional buys and outstanding savings. Let us know in detail your needs. UNITED REFRIGERATION CORPORATION, 514 W. 12th St., Los Angeles 15, Calif.

RESIDENTIAL & COMMERCIAL air conditioners—air cooled 1 ph.—230V. 2 hp. highside with horiz. evap. $357.00; 3 hp.—$489.00; 4 hp.—$684.00; 5 hp.—$761.00. 2 hp. self contained horiz. units $306.00; 3 hp.—$504.00; 4 hp.—$599.00. Additional 5% discount for quantities of 5 units one order to one destination. ARCTICAIRE MFG. CO., 2201 Grand—K. C., Mo., Telephone BA 1-7055.

COMPLETE HIGHSIDE and low side refrigerator systems. P91 compressor 115 V. 50/60 cy. F-12 Evaporator: 15¾" wide x 5¾" high x 12¾" deep, and static condenser. S-88 compressor 115 volts 60 cy. Freon 12; Evaporator 11" wide x 11½" deep x 9" high, and static condenser. Systems are charged and ready for installation. Sold $36.00 each FOB Chicago, Illinois. Send for free catalog on money saving refrigeration values. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

BUSINESS OPPORTUNITIES

FOR SALE: Refrigeration sales and service. Kelvinator franchise, air conditioning service, parts, hardware, small appliances and fishing tackle. In fast growing community. Owner wishes to retire. Land and buildings 24'—40' store lot 37'—80' vacant lot 40'—80' in rear with street frontage. LAYNE'S HOME APPLIANCE, 430 San Carlos, Ft. Myers Beach, Florida.

FOR SALE—Refrigeration service shop —Established 1943. Write—OWNER, 9402 So. Van Ness Ave., Los Angeles 47, California.

Marsh Elects A. D. Rose As President

SKOKIE, Ill. — At a recent meeting of the board of directors of Jas. P. Marsh Corp., A. D. Rose was elected president. He was formerly executive vice president.

A. D. Rose

Rose began his career with Jas. P. Marsh Corp. in 1918, working in what was then a small but growing instrument and valve company. In a relatively short period he became assistant to the sales manager and then general sales manager.

During the 1920's he organized the company's first engineering and development department and his name appears on many patents granted during the ensuing years. He became vice president and assistant general manager in 1942 and guided the affairs of the company during the war years.

After World War II, as general manager, he directed the company's development—both in physical growth and also in sales and market expansion. Under his direction the company increased its gross sales over 200% in the last decade, the announcement said.

Get your copy

Operating Costs of Residential Air Conditioning and What This Means to Dealers and Installers. By R. A. Gonzales—25¢ each.

Mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

Compressor Data For Air Conditioners

Data on most compressor models used by air conditioning equipment manufacturers who submitted product specifications for our March 9 Air Conditioning Showcase issue is published below. Lack of space in the specifications section prevented it from appearing there as planned.

Included in the data presented for each 1959 model air conditioner was the compressor manufacturer's model number.

By referring to the corresponding model number in this table, you can find the type, cooling method, cylinders, bore, stroke, and r.p.m. of the compressor or compressors used.

Model No.	Type	Hp.	Cooling Method	Cylinders	Bore	Stroke	R.P.M.
AIRTEMP							
2105-1	Open	40	Oil	5	3	2 3/4	1750
2107-1	Open	60	Oil	7	3	2 3/4	1750
2108-1	Open	60-75	Oil	3, 5	3	2 3/4	1750
2112-1	Open	100	Oil	5, 7	3	2 3/4	1750
3003-3	Hermetic	3	Suction	2	2 5/16	63/64	1750
3005-2	Hermetic	5	Suction	2	1 7/8	1 3/16	3500
3008-1	Semi-H.	7.5	Suction	5	1 7/8	1 1/2	1750
3011-1	Semi-H.	10	Suction	5	1 7/8	1 1/8	3500
3015-1	Semi-H.	15	Suction	5	1 7/8	1 1/2	3500
BENDIX-WESTINGHOUSE							
CH286TA-2	Hermetic	1	....	2	1 9/16	3/4	1725
CH383TA-2	Hermetic	1.5	....	2	1 9/16	1	1725
CH420TA-2	Hermetic	1.75	....	2	1 5/8	1	1725
CH490TA-2 H490TA	Hermetic	2	....	2	1 5/8	1 3/16	1725
YH700TA-2, 3	Hermetic	2.5	....	2	1 5/8	27/32	3450
YH830TA-2	Hermetic	3	....	2	1 5/8	1	3450
PH750	Semi-H.	(Not In Production)					
BRUNNER							
75HF	Hermetic	7.5	Suction	4	2	1 1/2	1750
100HF	Hermetic	10	Suction	4	2 3/16	1 1/2	1750
150HF	Hermetic	15	Suction	6	2 3/16	1 1/2	1750
COPELAND							
E52WC	Semi-H.	½	Water	2	1 3/8	3/4	1750
E77WH	Semi-H.	¾	Water	2	1 3/8	15/16	1750
DE100WH	Semi-H.	1	Water	2	1 9/16	15/16	1750
95-300	Semi-H.	3	Water	2	2 1/4	1 7/16	1750
UU-7	Hermetic	¾	Air	2	1 9/16	15/16	1750
UH-9	Hermetic	1	Air	2	1 1/2	15/16	1750
UW-8-100C	Hermetic	1	Air	2	1 11/16	15/16	1750
US9-150C	Hermetic	1½	Air	2	1 13/16	15/16	1750
US11-200	Hermetic	2	Air	2	1 13/16	15/16	1750
8R6-200	Semi-H.	2	Air	2	1 15/16	1 3/8	1750
8RO-300, 8R28	Semi-H.	3	Air	2	1 7/8	1 3/8	1750
3R42-300	Semi-H.	3	Air	2	2 5/16	1 3/8	1750
LRH-300	Semi-H.	3	Air	2	2 1/4	1 7/16	1750
LRH-400, 420	Semi-H.	4	Air	2	2 1/4	1 7/16	1750
LRG-500, 520	Semi-H.	5	Air	2	2 7/16	1 7/16	1750
MF-500	Semi-H.	5	Water	2	2 1/2	1 13/16	1750
MRF-500	Semi-H.	5	Air	2	2 1/2	1 13/16	1750
MRG-750	Semi-H.	7.5	Air	2	2 7/16	1 13/16	1750
MR50-750	Semi-H.	7.5	Air	2	2 9/16	1 13/16	1750
9R9-750	Semi-H.	7.5	Air	3	2 3/8	2	1750
9R9-1000	Semi-H.	10	Air	3	2 3/8	2	1750
9R8-1000	Semi-H.	10	Air	3	2 3/16	2	1750
DIALAIRE							
D155F40	Open	15	Water	4	2 1/2	2	1750
D205F60	Open	20	Water	6	2 1/2	2	1750
D255F60	Open	25	Water	6	2 1/2	2	1750
D305H40	Open	30	Water	4	3 1/4	2 3/4	1750
D405H40	Open	40	Water	4	3 1/4	2 3/4	1750
D505H60	Open	50	Water	6	3 1/4	2 3/4	1750
D605H60	Open	60	Water	6	3 1/4	2 3/4	1750
D755H80	Open	75	Water	8	3 1/4	2 3/4	1750
D1005H120	Open	100	Water	12	3 1/4	2 3/4	1750
SCHNACKE							
T	Open	....	....	2	3 3/32	3 3/4	600-1750
F	Open	....	....	4	3 3/32	3 3/4	800-1750
E	Open	....	....	8	3 3/32	3 3/4	800-1750
TECUMSEH							
AP411	Hermetic	¼	....	1	1 1/32	11/16	3500
AR-26	Hermetic	⅛	....	1	1 3/8	5/8	3500
AU-1612	Hermetic	1	....	1	1 3/8	3/4	3500
AU-14	Hermetic	1	....	1	1 1/4	5/8	3500
AU-1P12	Hermetic	1	....	1	1 1/2	3/4	3500
B1516	Hermetic	1	....	2	1 5/16	1 1/64	1750
B1613	Hermetic	1	....	2	1 3/8	13/16	1750
B1616	Hermetic	1	....	2	1 3/8	1 1/64	1750
B21T18	Hermetic	2	....	2	1 5/8	1 1/8	1750
B21U18	Hermetic	2	....	2	1 11/16	1 1/8	1750
B32P16	Hermetic	1½	....	2	1 1/2	1 1/64	1750
B74T16	Hermetic	2	....	2	1 5/8	1 1/64	1750
B8413	Hermetic	1	....	2	1 1/4	13/16	1750
B8513	Hermetic	1	....	2	1 5/16	13/16	1750
JB200	Hermetic	2	....	2	1 3/4	1.2	1750
JE200	Hermetic	2	....	2	2	1.2	1750
JE300, PJE300	Hermetic	3	....	2	2	1.2	1750
PJG300	Hermetic	3	....	2	1 7/8	1.2	....
PFB400	Hermetic	4	....	4	1 3/4	1 9/64	1750
FB500, PFB500	Hermetic	5	....	4	1 3/4	1 7/16	1750
S1T16	Hermetic	1	....	1	1 5/8	1 1/64	....
S2T16	Hermetic	½	....	1	1 5/8	1 1/64	....
S6N14	Hermetic	⅝	....	1	1 15/32	7/8	....
S7R16	Hermetic	¾	....	1	1 9/16	1 1/64	....
S8N16	Hermetic	1	....	1	1 15/32	1 1/64	....
WORTHINGTON							
2JF2-2	Semi-H.	2	Suction	2	1 15/16	1 7/16	1750
2JF2-3	Semi-H.	3	Suction	2	1 15/16	1 7/16	1750
2JF3-5	Semi-H.	5	Suction	3	1 15/16	1 7/16	1750
2JF5-7.5	Semi-H.	7.5	Suction	5	1 15/16	1 7/16	1750
2JF5-10	Semi-H.	10	Suction	5	1 15/16	1 7/16	1750
YORK							
F2656P	Hermetic	1½	Gas	2	1 3/4	7/8	1750
G2672P	Hermetic	2	Gas	2	1 3/4	1 1/8	1750
H2780H	Hermetic	3	Gas	2	1 7/8	1 1/4	1750
501	Hermetic	6.5	Gas	6	1 3/4	13/16	1750
TA682	Hermetic	8.75	Gas	6	1 3/4	1 9/32	1750
SA482	Hermetic	6.5	Gas	4	1 3/4	1 9/32	1750
HA380	Hermetic	3	Gas	3	1 3/4	1 1/4	1750
JA482	Hermetic	5	Gas	4	1 3/4	1 9/32	1750
KA682	Hermetic	7.5	Gas	6	1 9/32	1 3/4	1750

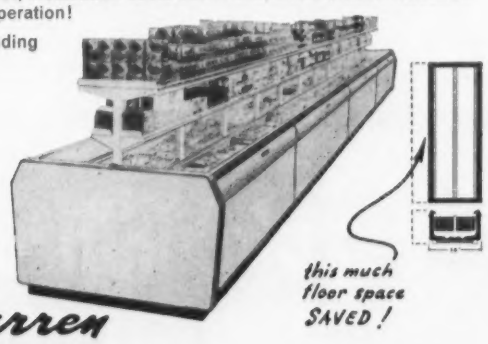
100% MORE VARIETY

...plus 45% greater capacity than conventional models

A PLACE TO PUT MORE FROZEN-FOOD VARIETIES was the problem presented to Warren by retailers everywhere, and 76 years of experience and research paid off again — with the space-saving, big-capacity **Twin-Isle* Merchandiser,** now in use by leading operators all over this country. The Twin-Isle offers two-side shopping from two compartments—both in plain view yet one refrigerator — holds 2,644 frozen-food packs or 2,160 pints of ice cream, and is only 58" wide over-all. Offers twice the variety of a conventional low-temperature display case!

Lower total investment in cases themselves, less horsepower per cubic foot, installation costs cut in half, and a drastic reduction in cost of operation!

*Patent Pending



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Frick Wins Plaque For Safety Record

PHILADELPHIA — On Feb. 15 of last year, the employes of Frick Co., Waynesboro manufacturing plant, began a safety drive which carried them through a stretch of one million hours worked without a disabling injury through Oct. 4, 1958, a new high in safety performance for the company.

For this achievement, the Frick plan has earned the highest award of the Pennsylvania Manufacturers' Association Casualty Insurance Co., the "Million Hour Plaque."

James F. Malone, executive vice president of the PMA firm, announced that presentation ceremonies were held recently in Harbaugh Hall of the Trinity Reformed church of Waynesboro.

At this dinner affair, which was the mid-winter meeting of the Frick Booster Club, Malone presented the plaque award to D. N. Benedict, Frick president and general manager.

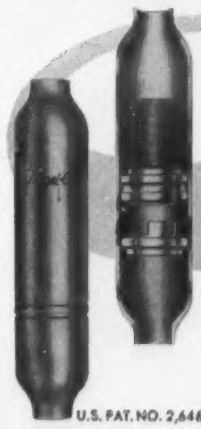
Cool Union Meeting Hall

BROOKLYN — Air conditioning is a feature of the new $750,000 union meeting hall and offices recently dedicated by Local 1814 of the International Longshoremen's Association.

spun end magni-chek and strainer combination

by WATSCo

Magni-Chek is a non-electric magnetically operated check valve, so finely calibrated that a fraction of an ounce of pressure will open the passage permitting a smooth flow without the usual pressure drop. A lifetime alnico magnet controls a floating disc which is drawn to a closed position when the pressure balances. This valve is designed for permanent installation with soft or hard solder.



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- HARD DRAWN COPPER SHELL
- LIFETIME ALNICO MAGNET SNAP ACTION
- LAPPED BRASS SEAT
- MINIMUM BACK PRESSURE
- MAXIMUM FLOW
- NOT AFFECTED BY SOLDERING HEAT
- LOW PRICED

This valve is also available without the strainer, and both types are available in the following sizes: ¼", 5/16", ⅜", ½", ⅝", and ¾". Special size inlet and outlet connection can be made to your specifications—Write us.

Send for Illustrated Catalog Dept. NN-3

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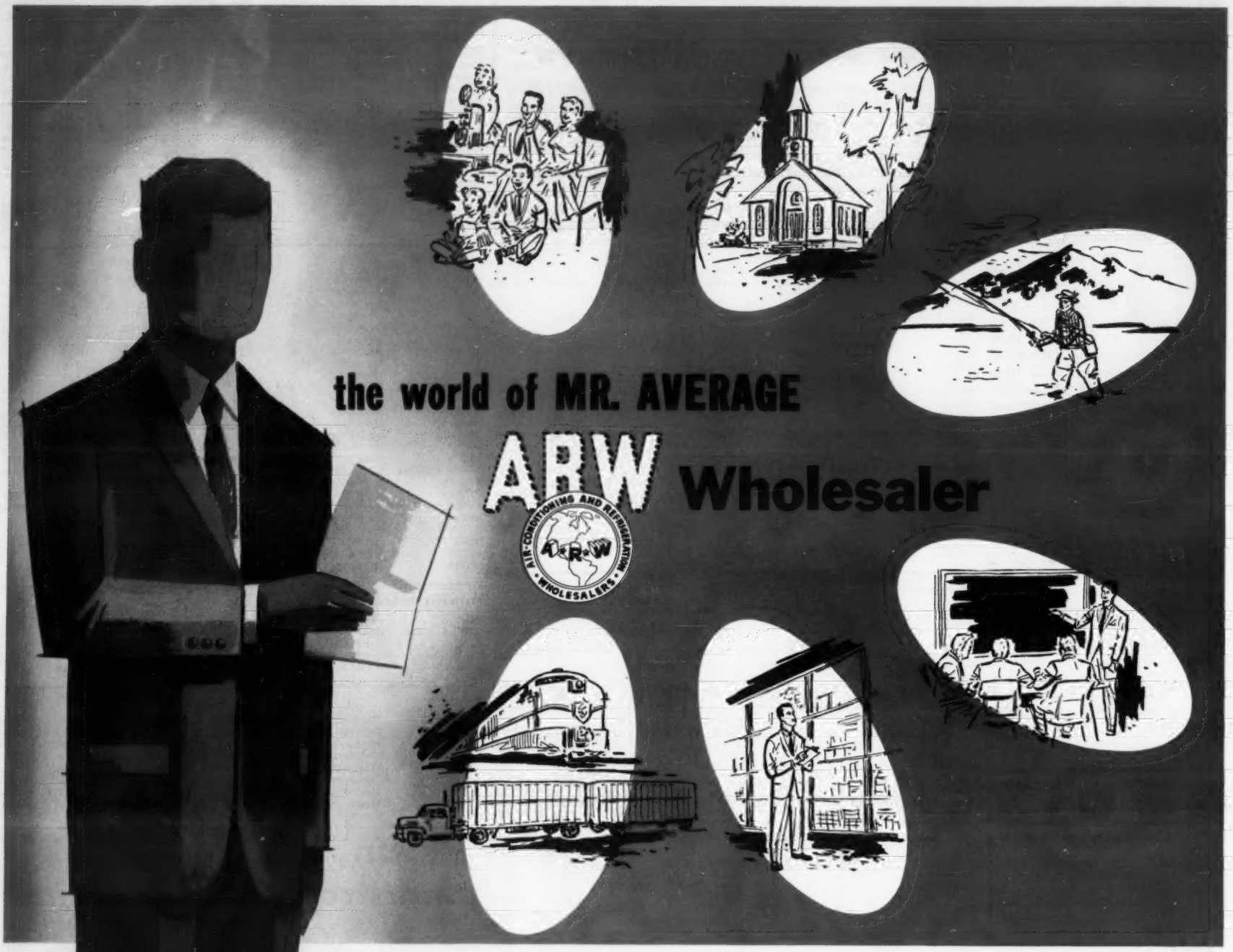
1020 EAST 15th STREET, HIALEAH, FLORIDA



his place in the community... his problems in business

Even in the noise and importance of today's business world, Mr. Average ARW Wholesaler finds time to serve his community. He is 47 years old, married, and he and his wife have contributed 3.3 children to the population.

He is a faithful, sworn supporter of his church... an active participant in church affairs. And he is a member of the local Chamber of Commerce, or some other civic group.

On vacation, or in daily leisure time, he's an angler who slyly sits and waits for the fish's response to his lure ...or a golfer who carefully curls in a ten-foot putt. Or his interest may be in hunting or boating.

His major business problem is managing a full, complex line covering all components... an average of 120 separate lines and 65,000 items. Therefore, he must personally train his salesmen to deliver a diversity of product knowledge, engineering assistance, and selection advice.

And constantly he is faced with the problems of inventory... keeping his lines current, and at the same time avoiding being choked off by product obsolescence arising out of the industry's rapid progressive pace.

To him, deranged delivery is deadly error... he must assure quick, accurate delivery... and properly packaged and protected products.

We know Mr. Average ARW Wholesaler... his determination and diversity benefits you... support him.

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